

BASKET-HANDLED BOWL; LA PLATA BLACK-ON-ORANGE. SITE 2

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MODIFIED BASKET MAKER SITES
ACKMEN-LOWRY AREA
SOUTHWESTERN COLORADO
1938

BY
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WITH A REPORT
BY
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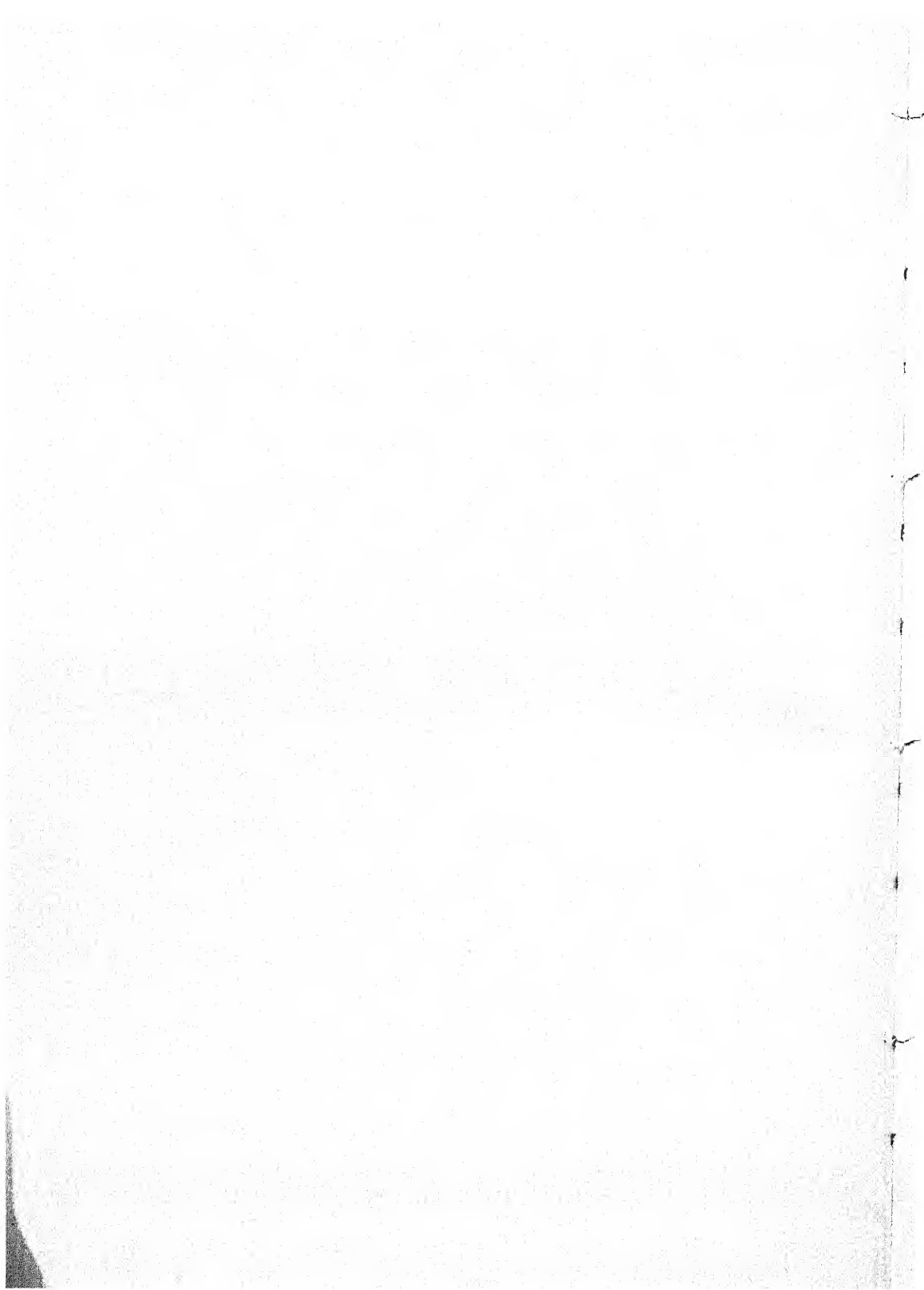
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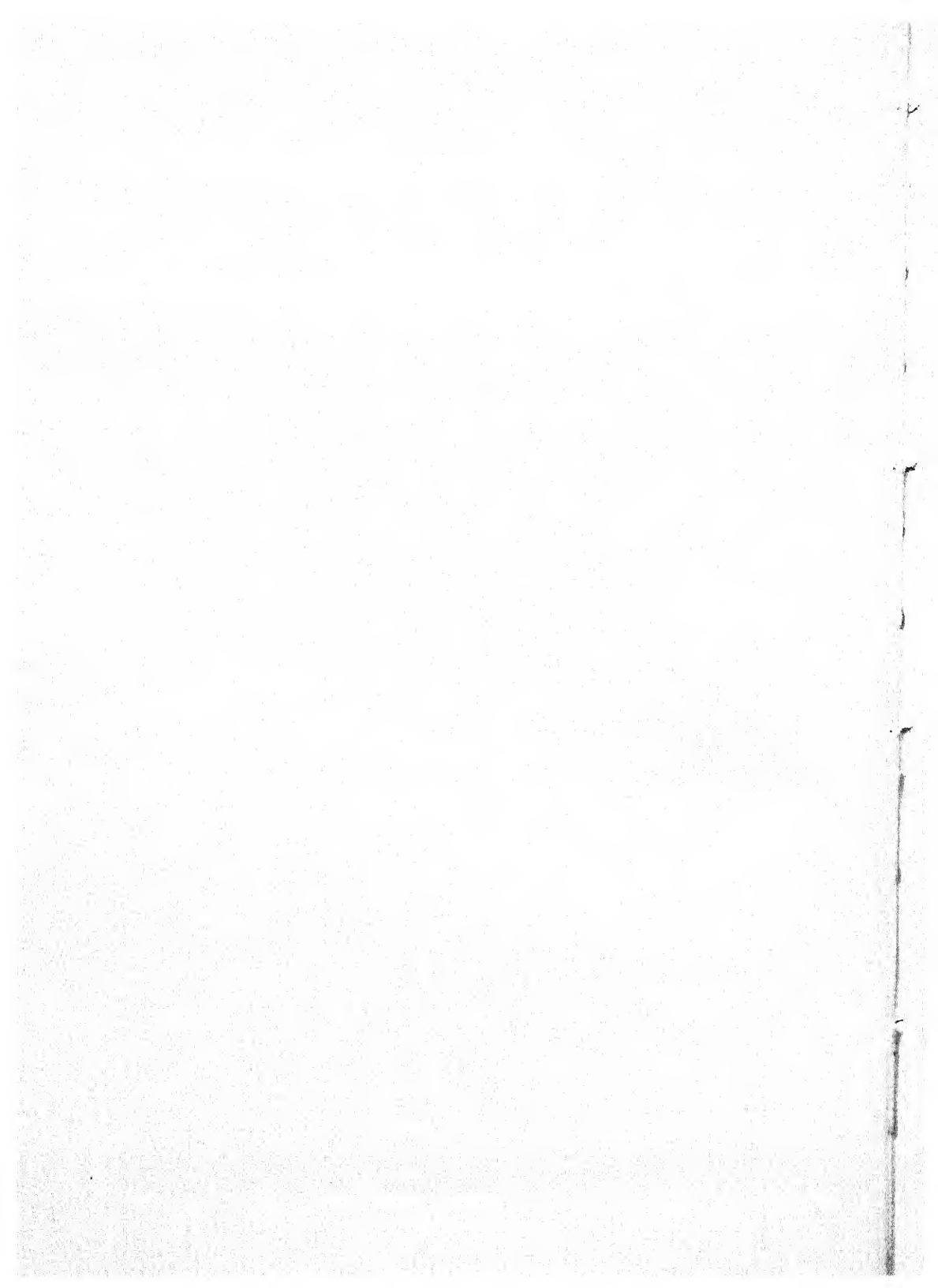
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PREFACE

The results of archaeological research made at two large sites in Township 39 N., Range 18 W., Montezuma County, southwestern Colorado, in 1938 by the Field Museum Archaeological Expedition to the Southwest are included in this report. Also included herein are brief summaries of work done by me in 1928 and 1929 for the Colorado State Historical Society in so-called unit-type houses located in the same area. Thus, this volume includes ten years of work.

Mr. Stanley Field, President of the Board of Trustees of Field Museum, again generously financed in entirety our season's work—the longest and most successful in which we have ever engaged. I cannot adequately thank him, but I can, at least, gratefully make acknowledgment of his aid and sympathetic interest. Mr. Clifford C. Gregg, Director of the Museum, is particularly to be thanked for removing as many obstacles as possible, for smoothing the way for our departure, and for co-operating in all possible ways during the season. I am very much his debtor.

I was again most fortunate in having an unusually competent staff of assistants.

Mr. Alexander Spoehr was our cartographer and in charge of excavations. His attention to all details and his thorough methods of excavation left no doubt in my mind that he had recovered all the evidence that existed. His technique was simplicity itself; every wall, every floor, every trench bottom was subjected to repeated trowelling and brushing and examination in various lights. All archaeologists who visited our sites were struck with the clean-cut operations and the skillful way in which the digging problems were handled. Excavating early houses, which, when abandoned for more than a thousand years, leave only the most fragile traces of their former existence, is a tremendously and discouragingly difficult task. The digging crew was likewise inspired by Mr. Spoehr's desire for exactness and performed the work well.

Mr. Robert L. Yule, Assistant in the Department of Anthropology at Field Museum, was in charge of photography. The very excellent illustrations in this report stand to his credit. The care with which he exposed and developed our negatives and his attention to suitable kinds of films and filters account for his success. I am very grateful to him for managing his department so well, for his sage advice, and for his companionship.

Movies in color of our work and of our camp life were taken with a very excellent camera presented by Mrs. Edna Horn Mandel. I am glad to take this opportunity to thank her for her thoughtful gift.

Mr. Carl Lloyd, who prepared our press releases, assisted Mr. Spoehr in surveying and supervising the excavations and took charge of preserving—a delicate, tedious task—all wood which we saved for dendrochronological purposes. He also faithfully attended to many other unspectacular duties, so numerous that it is impossible to enumerate them, but which must be regularly discharged if an expeditionary camp is to run smoothly. It is a pleasure to express my gratitude for his services.

Mr. John Rinaldo was of invaluable aid in washing, classifying, counting and packing sherds, mending pottery, and cataloguing and classifying stone and bone artifacts. Throughout the summer he kept abreast of the thousands of sherds and artifacts which came in daily. Mr. Rinaldo continued his services as volunteer assistant after we returned to the Museum and has prepared the report on the stone and bone artifacts included herein.

Mr. Donald Collier, who joined our camp staff near the close of the season, lent me aid whenever I needed it. At the close of camp he drove me many hundreds of miles in his car as we searched for new sites.

I am again much indebted to Mr. and Mrs. Clyde D. Long, who permitted us to use their ranch and house as base headquarters. Mrs. Long also purchased all food.

Miss Lillie Wayman contributed to our general well-being and happiness by providing us with excellently cooked food. Good, simple meals are indispensable to an expedition. I am glad to acknowledge hereby my thanks.

The men, some of whom have been with me for ten seasons, who bore the brunt of the heat, dust, and fatigue of the actual digging, need specially to be remembered and thanked. I therefore name them so that they may know that the Museum and I are mindful of what we owe them: S. T. Bangs, David Brookshier, Luke Lancaster, Harold Long, Hugh Pigg, Richard Shrader, Bert Swain, Jack Vining, and Ralph Vining.

Miss Marjorie Kelly, volunteer assistant at the Museum and a graduate of the Department of Anthropology, University of California, mended and restored the pottery herein illustrated, helped tabulate and compute percentages on the potsherds, and assisted in

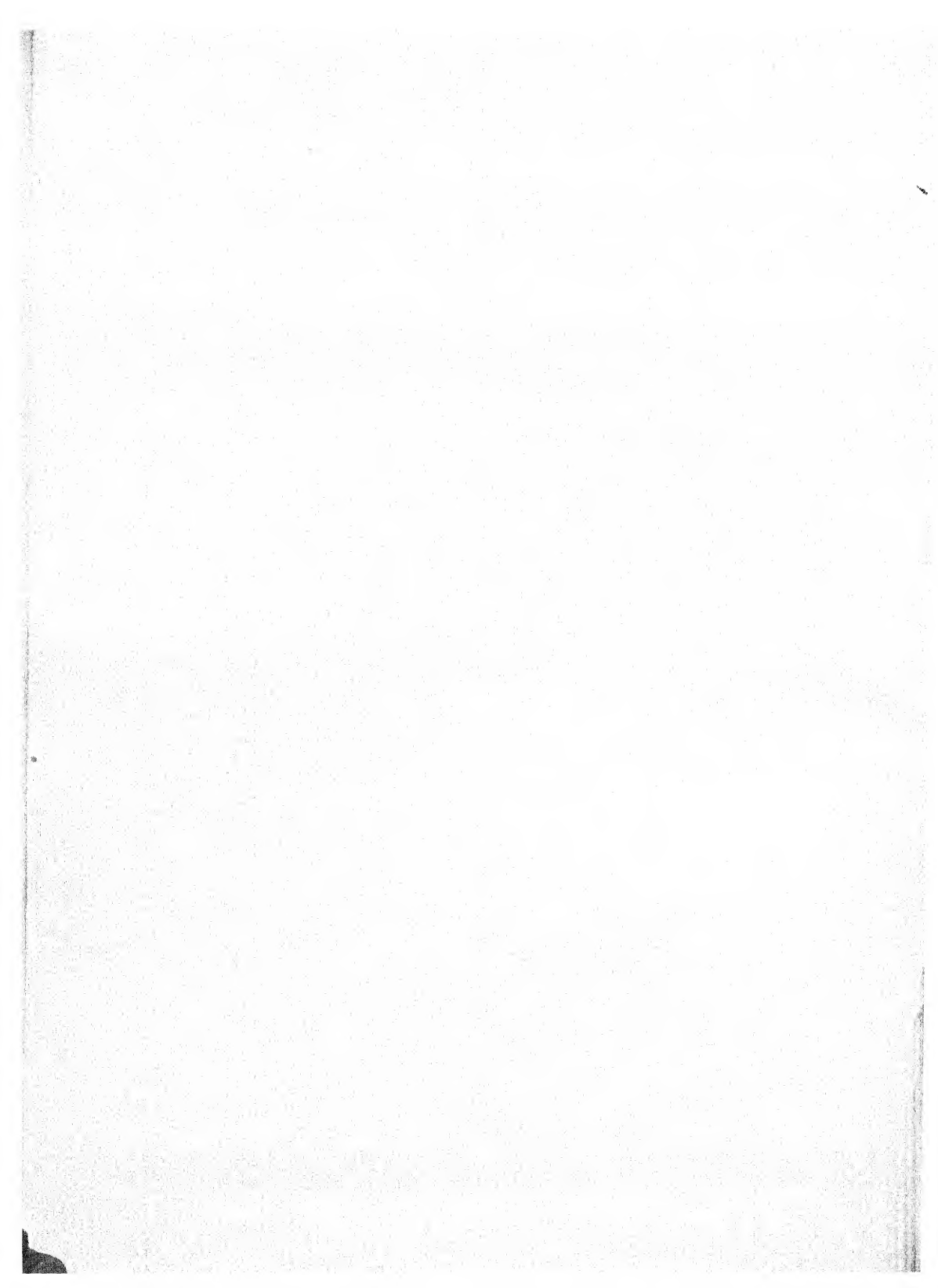
preparing this report in many other ways. I am greatly indebted to her for her invaluable and cheerful aid.

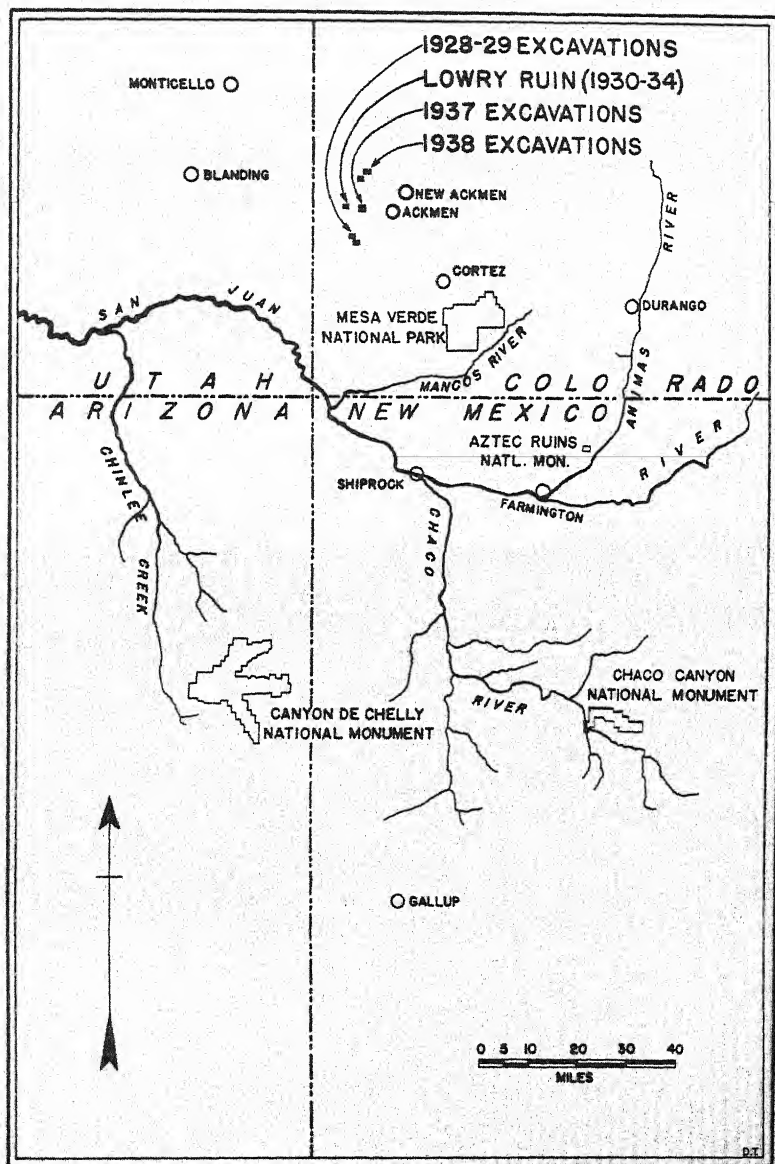
Special thanks are due Miss Lillian Ross, Editor in the Division of Printing at the Museum, for her many helpful suggestions in preparing the convenient format of this report, for her aid in clarifying my diction, and for her very careful reading of the proofs. I am happy to acknowledge my indebtedness for her interest not only in this publication but also in the other two parts of this volume.

The tree-ring dates used in this report were provided by Mr. Harry T. Getty, of the Department of Anthropology, University of Arizona. Mr. Getty carefully examined in record time the five hundred pieces of wood which we sent him. All the dates which he sent me were checked by Dr. A. E. Douglass, Director of Steward Observatory, University of Arizona, and by Dr. Emil W. Haury, Chairman of the Department of Anthropology, University of Arizona. I wish specially to thank Mr. Getty, Dr. Douglass, and Dr. Haury for their co-operation.

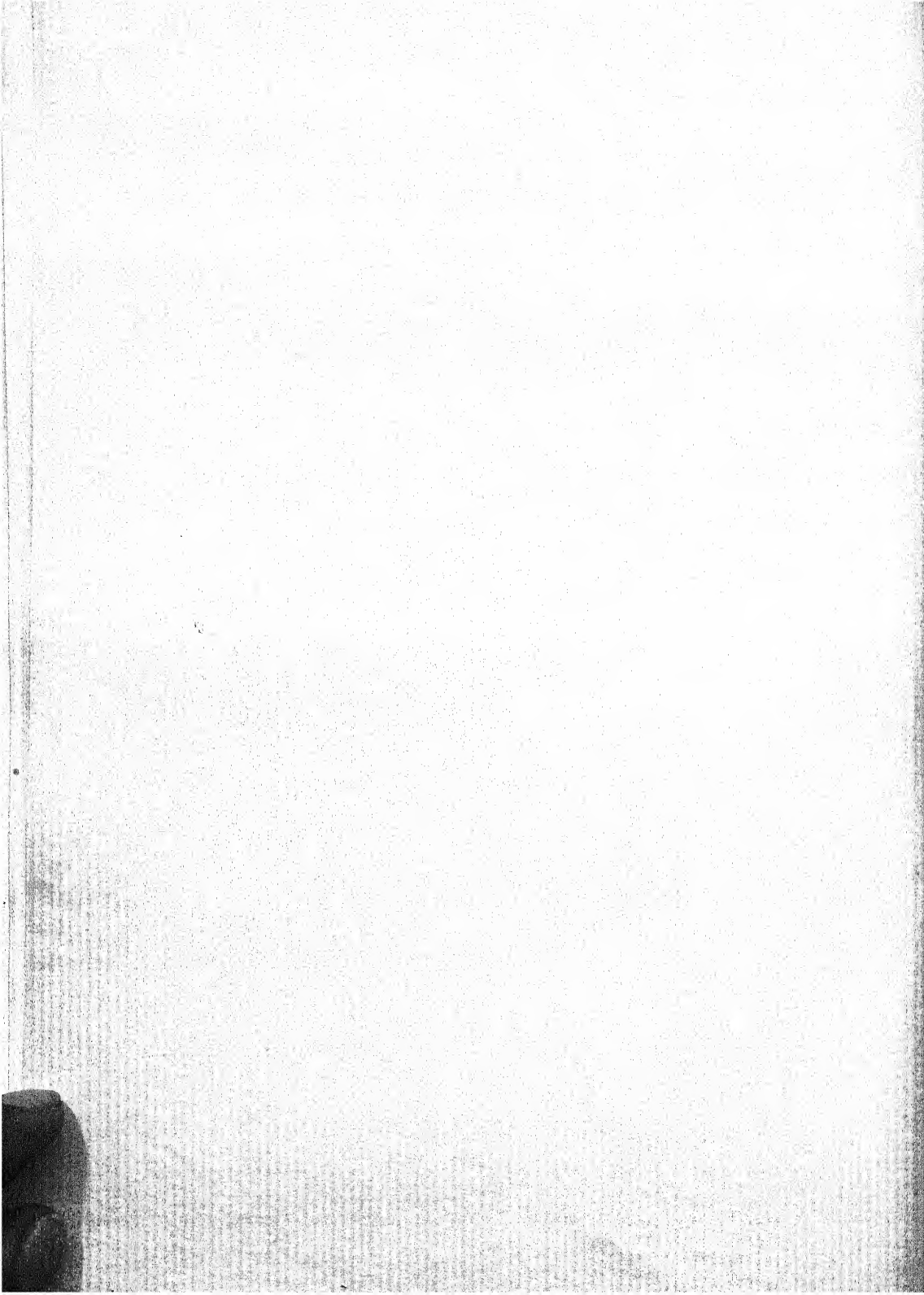
The general reader will find Chapter V, the Synthesis, less technical and more enjoyable than the other sections. The summary of Pueblo history (in southwestern Colorado), given on pages 460 to 467, was specially prepared for him.

PAUL S. MARTIN





MAP 10. ACKMEN-LOWRY AREA



MODIFIED BASKET MAKER SITES SOUTHWESTERN COLORADO

I. INTRODUCTION

LOCATION OF SITES

The two sites which were excavated in 1938 are located on Federal Public Domain in the Northwest Quarter of Section 20, Township 39 N., Range 18 W., N.M.P.M., Montezuma County, Colorado, about twenty-six miles northwest of Cortez, Colorado, and about seven miles west of the new Ackmen. Permission to excavate these sites was obtained from the Secretary of the Department of the Interior. The altitude is approximately 6,700 feet above sea level. Lowry ruin, excavated by Field Museum from 1930 to 1934, is situated about six miles southwest of the 1938 sites and the sites excavated in 1937 lie about four miles south.

Site 1 is located on a narrow point on the south rim of Cahone Canyon. This tongue of land is covered mostly with a heavy growth of sagebrush and an occasional juniper or pinyon. Soil on this point is very thin and in many places the bed-rock is exposed.

Site 2 also lies on a point between two smaller unnamed canyons, both of which drain into Cahone. Junipers and pinyons, with the former predominating, were dense, and sagebrush was scarce.

PHYSIOGRAPHIC AND BIOTIC CONDITIONS

The physiographic and biotic conditions for the two sites are the same as those given for the Lowry ruin (Martin, 1936).

PROBLEMS

From the archaeological survey conducted by Lloyd (Martin, 1938) we knew that the following cultural periods had existed in that portion of southwestern Colorado bounded on the east by the Dolores River, on the south by Ute Mountain, on the west by the state line, and on the north by the town of Dove Creek: Modified Basket Maker, Developmental Pueblo, and Great Pueblo. During the past ten years, I have investigated the Developmental Pueblo (Pueblo I and II) and the Great Pueblo periods. To fill in the gap, work needed to be done in the period which preceded these; namely, the Basket Maker period.

This research was undertaken and accomplished during the season of 1938. The sites which we investigated were chosen on the

basis of sherd analysis and on examination of the ruins, because it seemed probable that they would yield a fair sample of the typical Basket Maker culture as it existed in southwestern Colorado.¹

Our "hunch" was more than fulfilled. These sites were just what we needed to fill in the lacunae and they hooked on perfectly to the work of the previous season. With the publication of this report, our work in that area is finished, for we have investigated and reported (Martin, 1936, 1938, and 1939) on all the manifestations of cultures from Basket Maker period to Great Pueblo period, or roughly from A.D. 700 to A.D. 1150. When the investigations of Mr. J. O. Brew, who excavated on Alkali Ridge, Utah, for Peabody Museum, Harvard University, and those of Mr. Earl H. Morris, who has done a vast amount of work in territory between Durango, Colorado, and the eastern portion of Mesa Verde National Park for Carnegie Institution, have been published, archaeologists will have a very complete history for the entire region.

¹ Methods of excavation and cartography were much the same as those employed in the previous season—with, of course, some modification rendered necessary by slightly different kinds of terrain and sites (Martin, 1938, pp. 239-240).

II. DESCRIPTION OF ARCHITECTURAL DETAILS

SITE 1

Site 1 consisted of two large circular structures (Great Kivas?), one of which (Kiva I) was bordered by a few peripheral rooms; many surface rooms (number estimated at 75 to 100); and pit houses (number estimated at 15 or more).

The surface rooms were built around three sides (north, east, and west) of a large square; in the plaza thus formed were the pit houses and the smaller of the Great Kivas (Kiva I). The larger Great Kiva lay about 200 meters farther south.

Twelve surface rooms were completely excavated: six (Rooms 1-6) in House Group I, located on the west edge of the mesa; and six (Rooms 7-12) in House Group II, located on the east edge of the mesa. In addition, three of the peripheral rooms of Kiva I were cleared of debris and thoroughly examined.

Three pit houses (A, B, and C) were completely excavated and two partially so.

The fill of the surface rooms was made up of dark brown earth, many wall stones, refuse containing charcoal, sherds, bone and stone implements, and some aeolian deposits.

The fill of the pit houses was made up almost entirely of refuse containing charcoal, sherds, bone and stone implements, and very few rocks.

The fill of Kiva I consisted almost entirely of countless large slabs, which had once made up the upper portions of the coursed masonry wall.

The fill of Kiva II was extremely shallow and was composed (near the periphery) of hard-packed wind-deposited dirt, a few fallen slabs, and some rubble.

The superficial rooms were excavated in two levels, the upper level consisting of all fill to within 5 cm. above the floor and the lower level, the remainder of the fill (5 cm.). The pit houses were excavated in 20 cm. levels.

HOUSE GROUP I, SITE 1

(Figs. 59-65 and Maps 11, 12)

House Group I (Figs. 59, 60): a double row of surface rooms; front row probably used for living quarters, the rear row for storage of food. Rooms 3, 4, 5, and 6 had burned. Entrance (except Room 5) probably through roof; in Room 5, possibly through lateral opening.

Walls of crude, coursed masonry; laid without foundation on bed-rock. Stones, undressed slabs of sandstones; great variation in size; largest stone, 80 by 32 by 15 cm.; smallest, 15 by 10 by 2 cm.; average size, 55 by 25 by 5 cm. Masonry of through-stone construction. Corners not bonded. Spalls scarce; of sandstone; irregularly shaped; average dimensions 8 by 5 by 2 cm.; do not touch wall stones ("false spalls;" Martin, 1936, p. 29). Mortar of local brown clay, untempered; greatest thickness, 17 cm.; least thickness, 2 cm.; average about 5 cm. Original height (estimated), 1.5 meters. Height, when excavated, one to four courses; greatest height, 56 cm.; least height, 25 cm. Slabs, placed upright, occasionally used (Room 5). Cross walls similar, except for smaller stones (Figs. 61, 62).

Floors of smoothed adobe laid on bed-rock; sometimes of bed-rock without mud covering (Fig. 63).

Firepits of two types: (1) Large oval pit, divided into two parts by partition either of mud or of stone (metate used in one instance); (2) round single pits of the usual type. Both types lined with brown sand. Found only in front row of rooms (Rooms 3, 4, 5, 6) (Figs. 64, 65).

Deflector (broken), a stone slab set upright in front of ventilator (Room 5).

Ventilator (used also as entrance?) of lateral type. Shaft small; walls of vertical slabs; original height unknown (Room 5).

Tunnel very stubby, about 41 cm. long. Entrance to tunnel decreased in size by addition of two sections of masonry at sides of entrance (Room 5).

Cists shallow; walls of adobe or bed-rock.

Post-holes sunk into bed-rock and set near the walls of the rooms. One room had only four; another, twelve. Depth ranged from 3 cm. to 21 cm.; diameters ranged from 6 cm. to 21 cm. Small rocks found tightly packed around peripheries of some post-holes. Decayed or charred butts of upright posts found in all post-holes.

Roofs, exact character unknown. Estimated height, 1.5 meters or slightly more. Probably supported partly or wholly by posts, upper ends of which may have been crotched. Ends of roof beams may also have rested on walls. Beams probably not large, as shown by beam impressions on chunks of burned adobe recovered from floors.

The following details were lacking: plaster and doorways (except possibly Room 5).

Pottery.—Predominant types: Lino gray, Kana-a gray, and Abajo red-on-orange (see Chapter IV).

Dates.—Room 5, A.D. 859, 860.

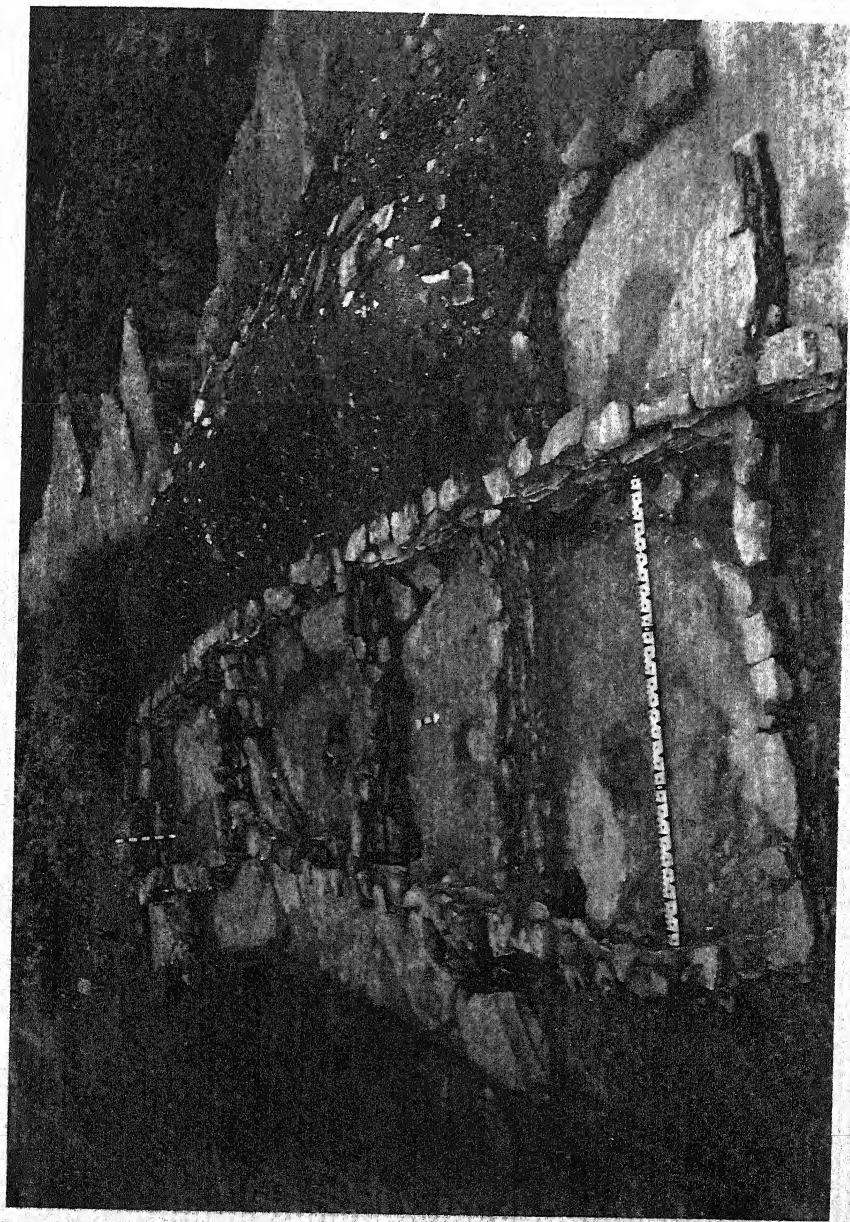


FIG. 59. Site 1, House Group I, showing Surface Rooms 1-6. Arrow (50 cm. long) points magnetic north; three-meter rod in foreground; meter stick in background. Note canyon rim at right.



FIG. 60. Site 1, House Group I, Room 5. Ventilator(?) in foreground, double firepit in center of room. Arrow (50 cm. long) points magnetic north.



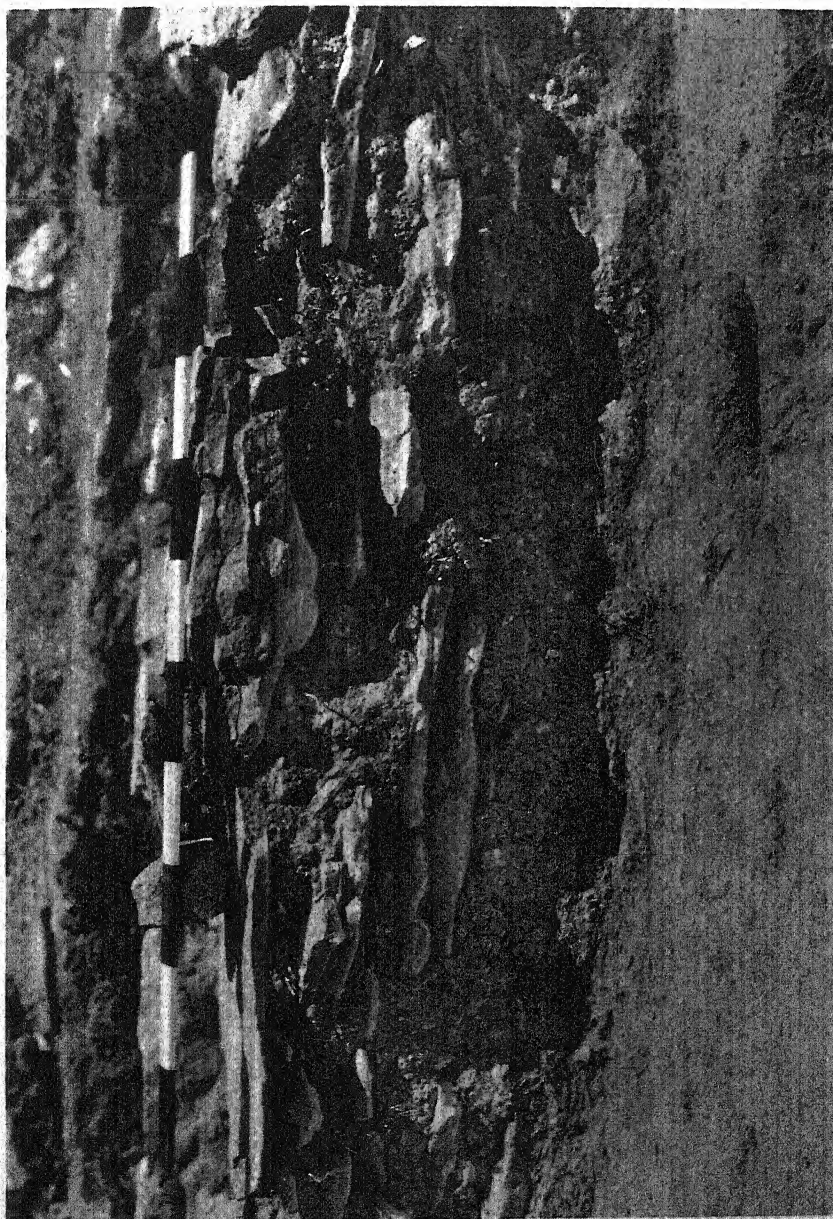


FIG. 61. Site 1, House Group 1. Masonry in north wall, Room 4. Meter stick on top of wall.

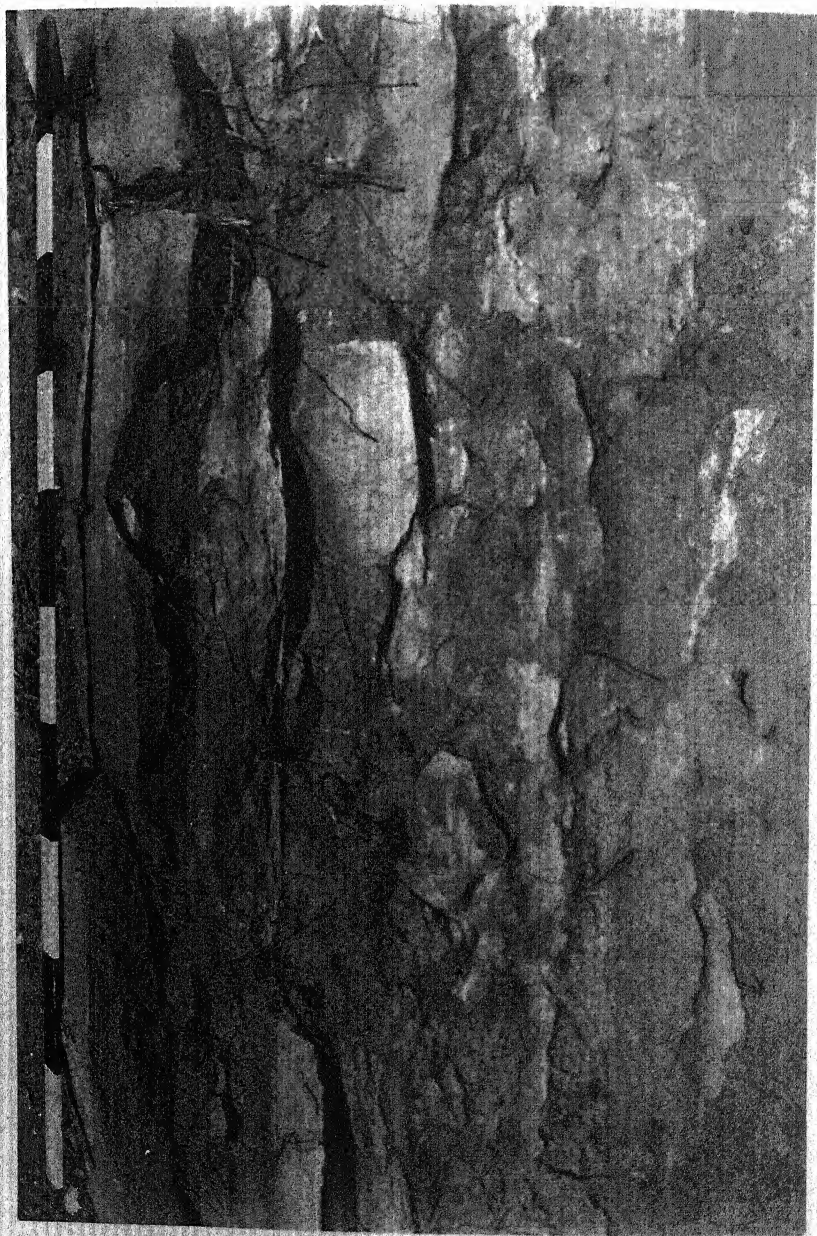


FIG. 62. Site 1, House Group I. Masonry in west wall, Room 5. Meter stick on top of wall.

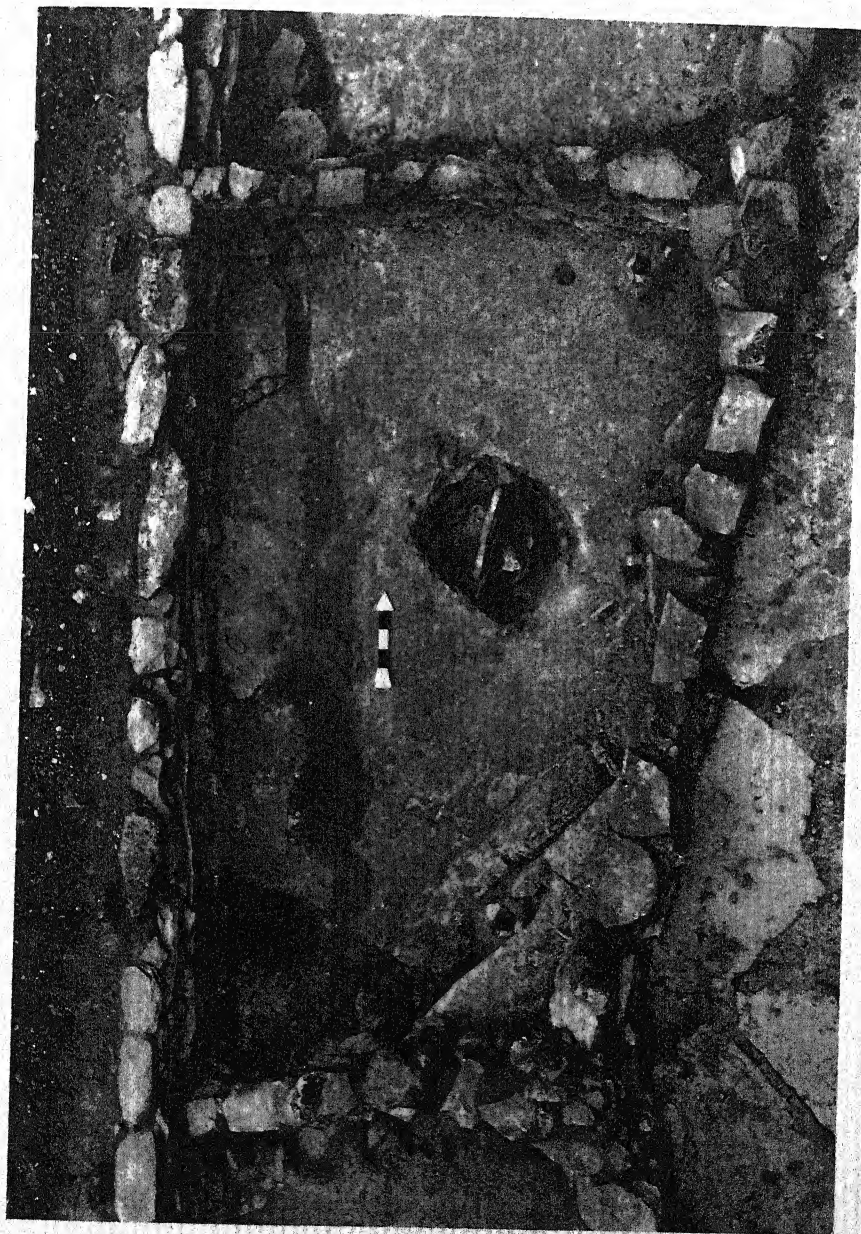
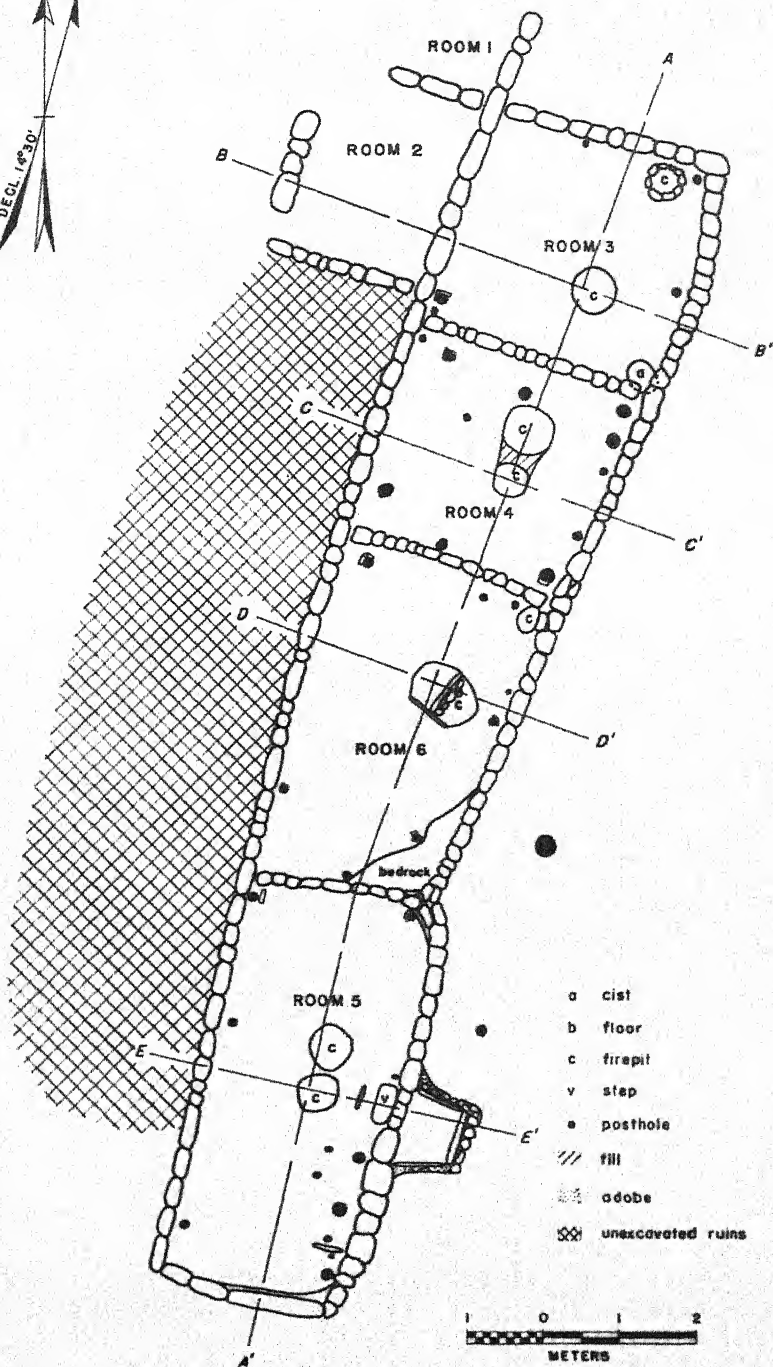


FIG. 68. Site 1, House Group I, Room 6. Showing double firepit in center of room, floor of bed-rock, and post-holes for roof support. Arrow (50 cm. long) points magnetic north.



FIG. 64. Site 1, House Group I. Double firepit in Room 6, divided by a metate. Arrow (50 cm. long) points magnetic north.



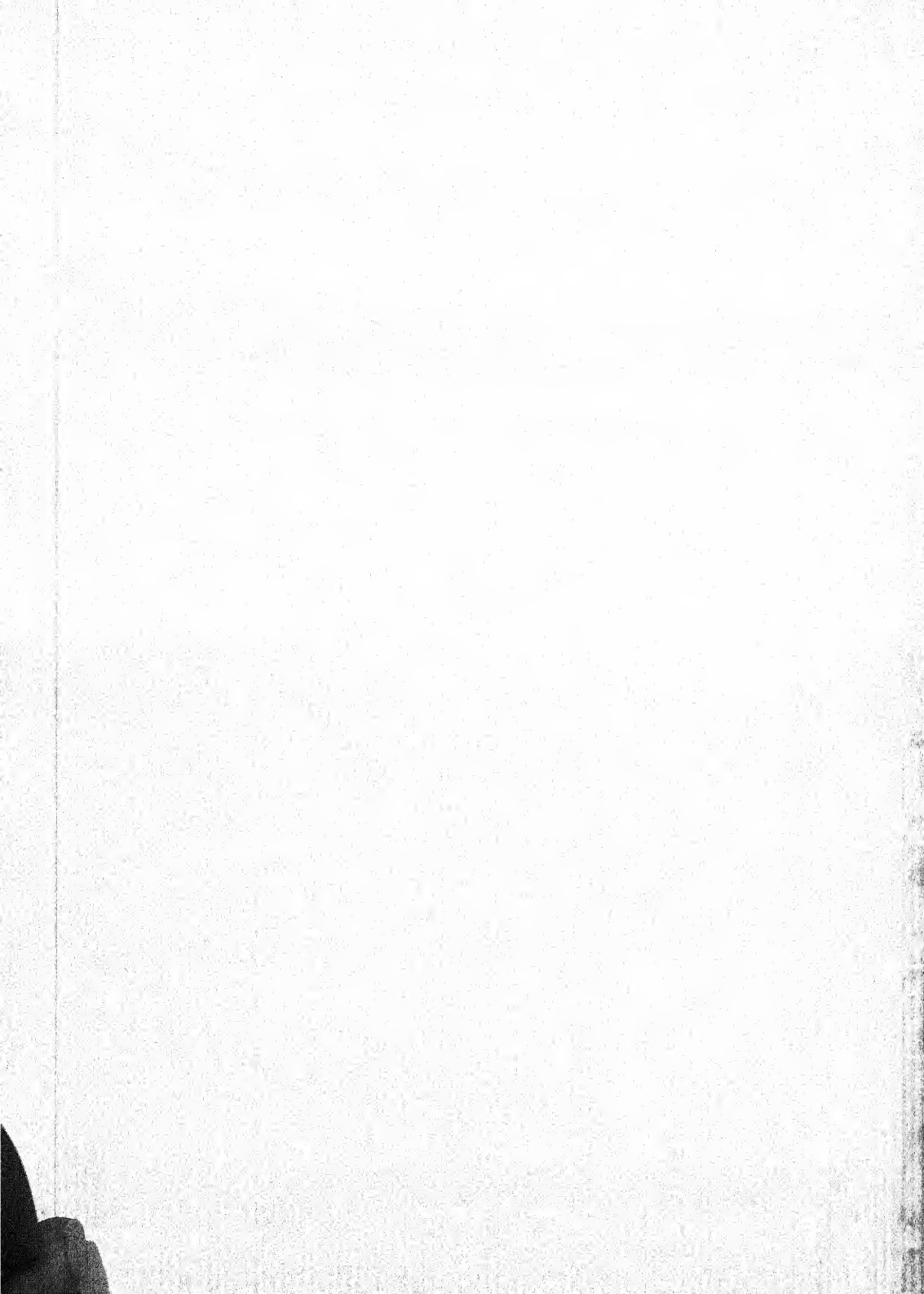




FIG. 65. Site 1, House Group I, Room 4. Showing firepit in original condition (without dirt partition), and post-holes. Arrow (50 cm. long) points magnetic north.

HOUSE GROUP II, SITE 1

(Figs. 66-70 and Map 13)

House Group II: a double row of superficial rooms; front row probably used for living quarters, and rear row for storage of food. Rooms 7, 8, 9, 11, and 12 had been partially destroyed by fire (Fig. 66). Entrance probably through roof.

Walls of two types: (1) Main walls of crude, coursed masonry; laid without foundation on bed-rock; undressed slabs of sandstone used; great variation in size: largest stone, 71 by 28 by 7 cm.; smallest, 19 by 15 by 6 cm.; average, about 31 by 25 by 13 cm. Masonry of through-stone construction. Corners not bonded. Spalls scarce, of sandstone, irregularly shaped, varying in size from 11 by 9 by 4 cm. to 4 by 4 by 1 cm.; do not touch wall stones. Mortar of local clay, untempered; greatest thickness, 26 cm.; least thickness, 2 cm.; average, about 6 cm. Original height (estimated), 1.5 meters; height when excavated, three to seven courses; greatest height, 1.11 meters; least height, 42 cm. (2) Cross walls, either of posts (between Rooms 10 and 11) spaced about 30 cm. apart, spaces between posts plugged with small rocks and slabs; or of small narrow stones laid in courses (between Rooms 9 and 11), courses separated by very thick beds of mud mortar (Figs. 67, 68).

Floors of smoothed adobe (often burned) laid on bed-rock; sometimes of bed-rock without mud covering.

Firepits circular. Two, lined with fine brown sand or slabs or both. One (Room 11) constructed by placing ring of rocks on bed-rock and plastering these with adobe. All contained ashes.

Deflectors.—None found.

Ventilators.—Two, one in Room 8, one in Room 12. Both of lateral type (tunnel-openings in south walls). Tunnels and shafts small (about 30 cm. square), of crude masonry. Original heights of shafts unknown (Fig. 69).

Bins.—Three in Room 12, two in Room 8. Walls of bins in Room 12 formed partly by slabs (two metates included) set upright and partly by room walls; floors same as room floors (bed-rock). Walls of bins in Room 8 formed partly by upright slabs, partly by room walls; floors of large slabs. Bins in Room 12 contained troughed metates, only one end of troughs open (Fig. 70).

Post-holes sunk in bed-rock. Each room provided with at least two; Room 8, with twelve. Depth ranged from 3 cm. to 25 cm.; diameters, from 9 cm. to 23 cm. Small rocks packed tightly around peripheries of some post-holes. Decayed or charred butts of upright posts found in all post-holes.

Roofs, exact character unknown. Estimated height, 1.5 meters or slightly more. Probably supported by posts, upper ends possibly crotched; covered by small poles, twigs, and adobe (evidence from large pieces of burned adobe found in fill).

Pottery.—Same as for House Group I (see Chapter IV).

Dates.—Room 11, A.D. 856 ± x.

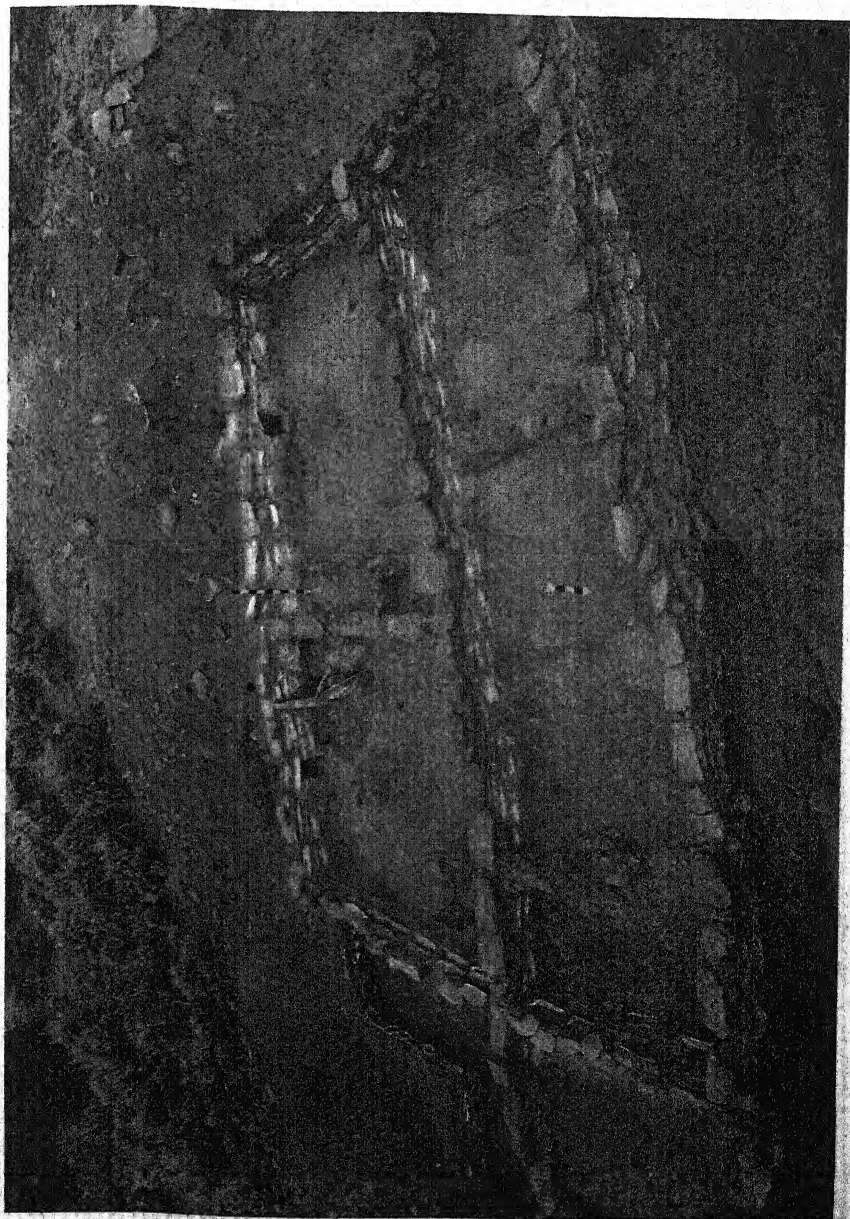


FIG. 66. Site 1, House Group II. In foreground (left to right) Storage Rooms 7, 9, 11, 10; in background (left to right) Living Rooms 8 and 12. Note ventilators in rooms in background. Arrow (50 cm. long) in foreground points magnetic north, meter stick in Room 12.

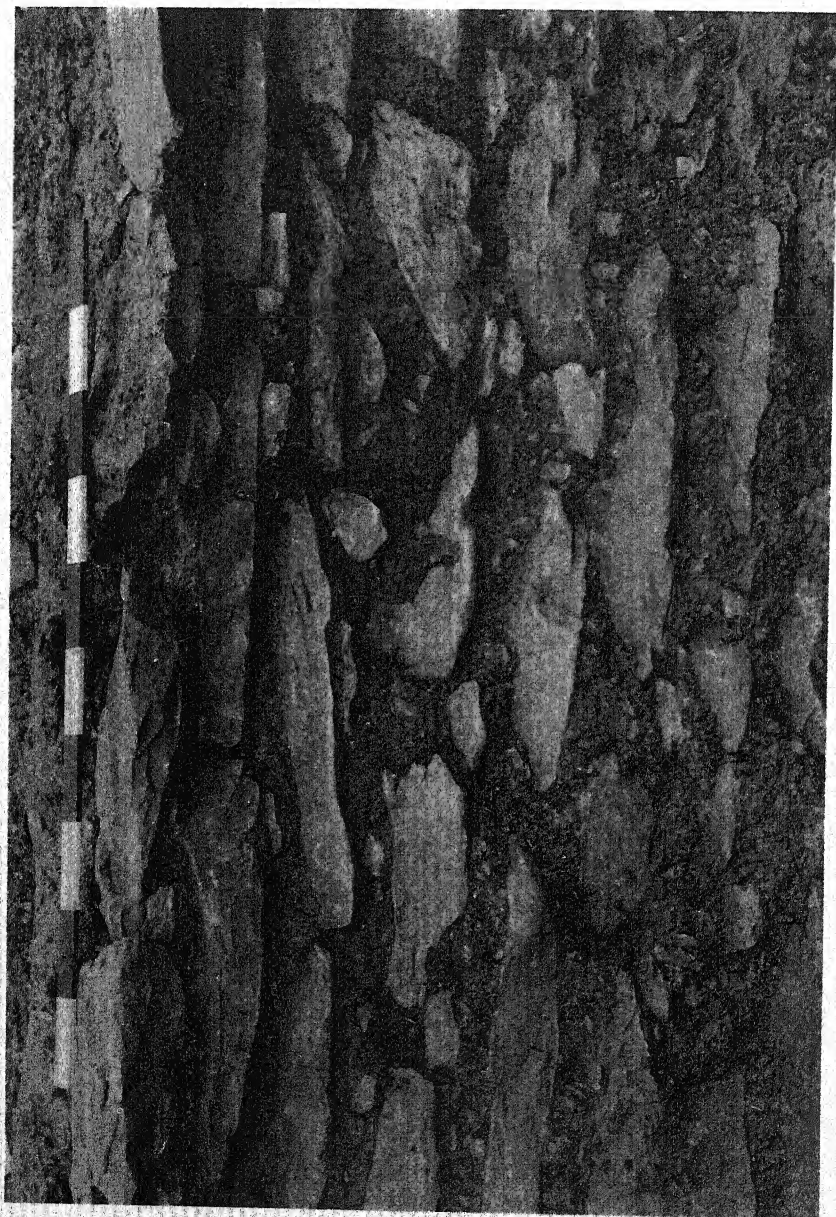


FIG. 67. Site 1, House Group II. Through-stone masonry, north wall, Room 10. Meter stick on top of wall.



FIG. 68. Site 1, House Group II. Through-stone masonry, north wall, Room 12. Meter stick on top of wall.

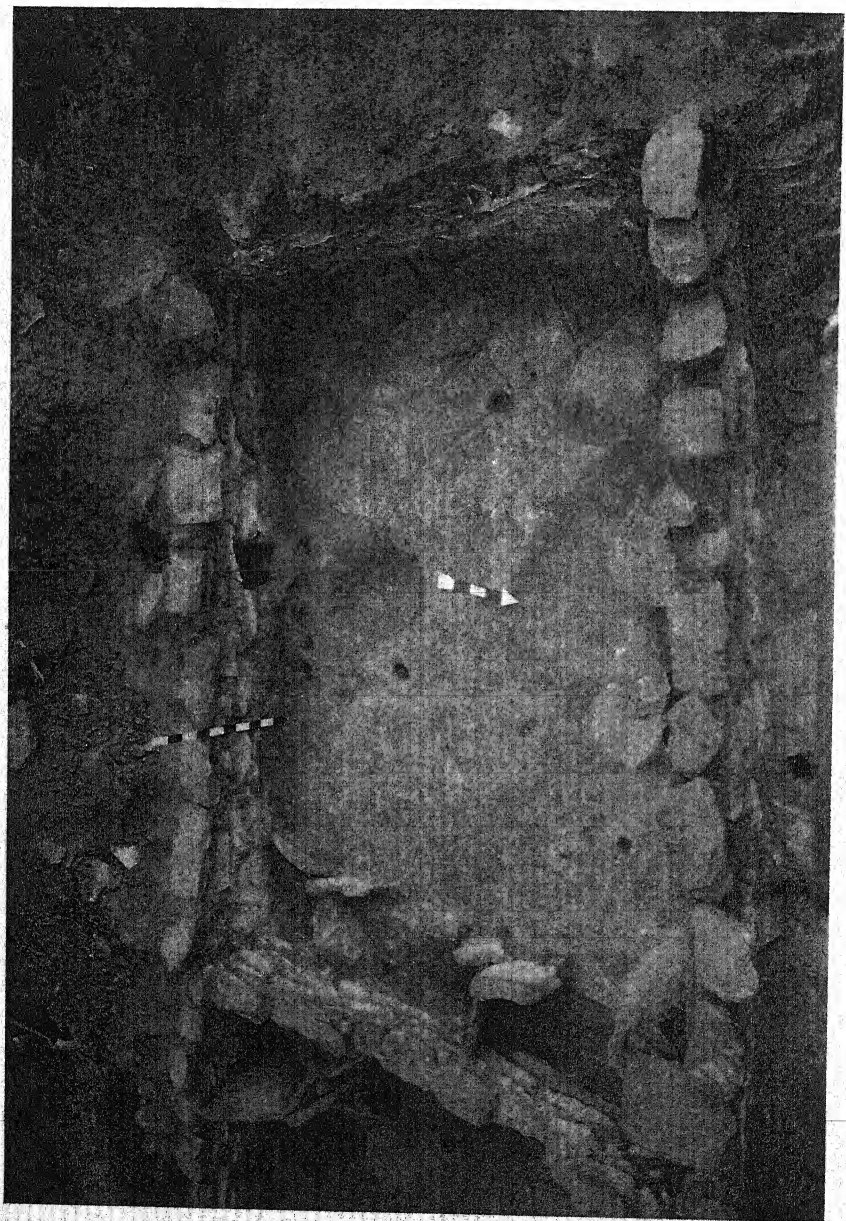
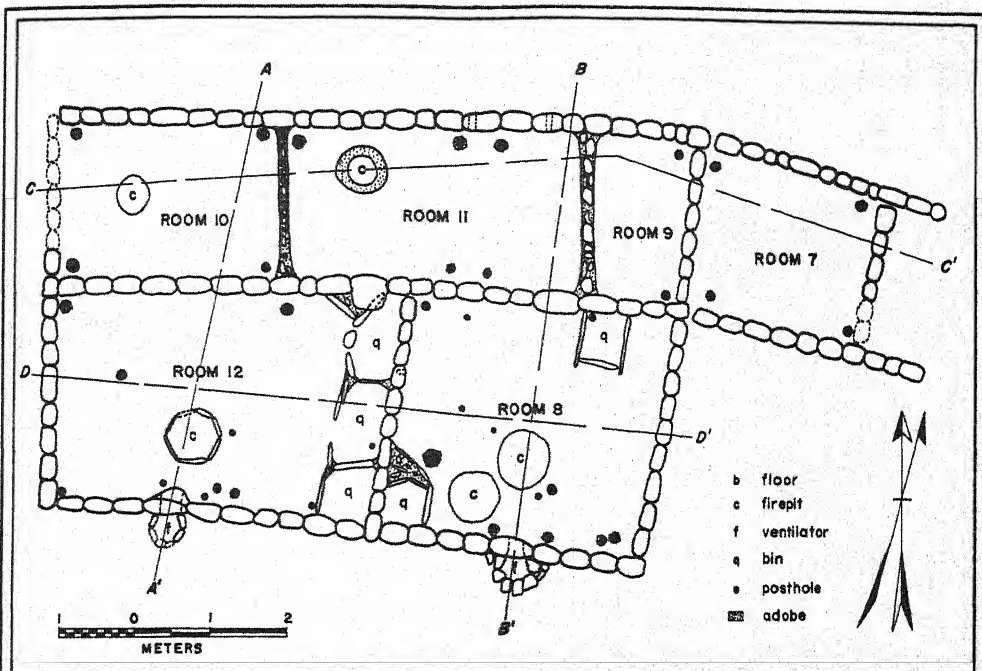
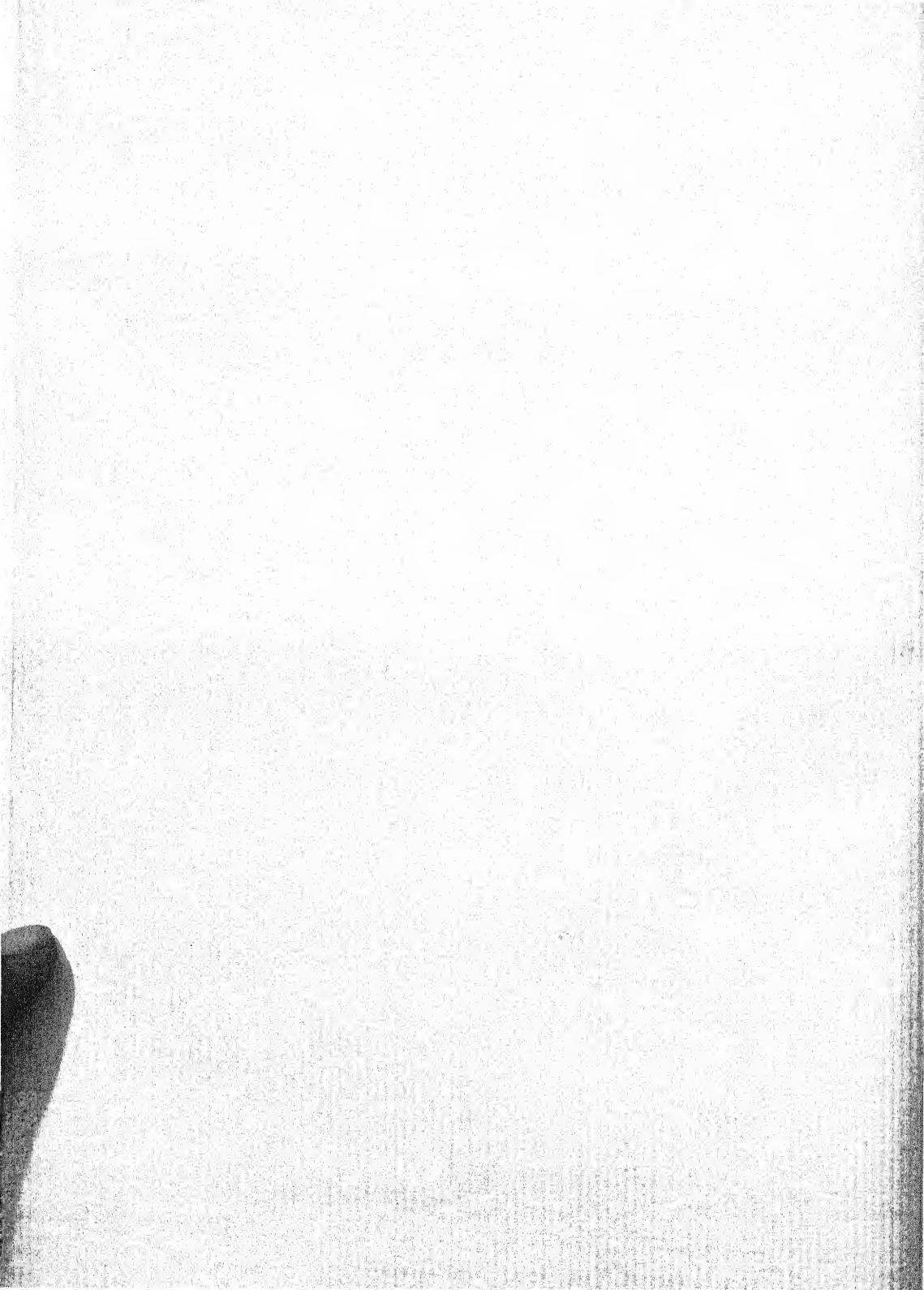


FIG. 69. Site 1, House Group II, Room 12. Ventilator complex in south wall, firepit in center, post-holes, bed-rock floor, bins at left. Arrow (50 cm. long) points magnetic north; meter stick in background.



Map 12. GROUND PLAN AND SECTIONS OF HOUSE GROUP II, SITE 1.



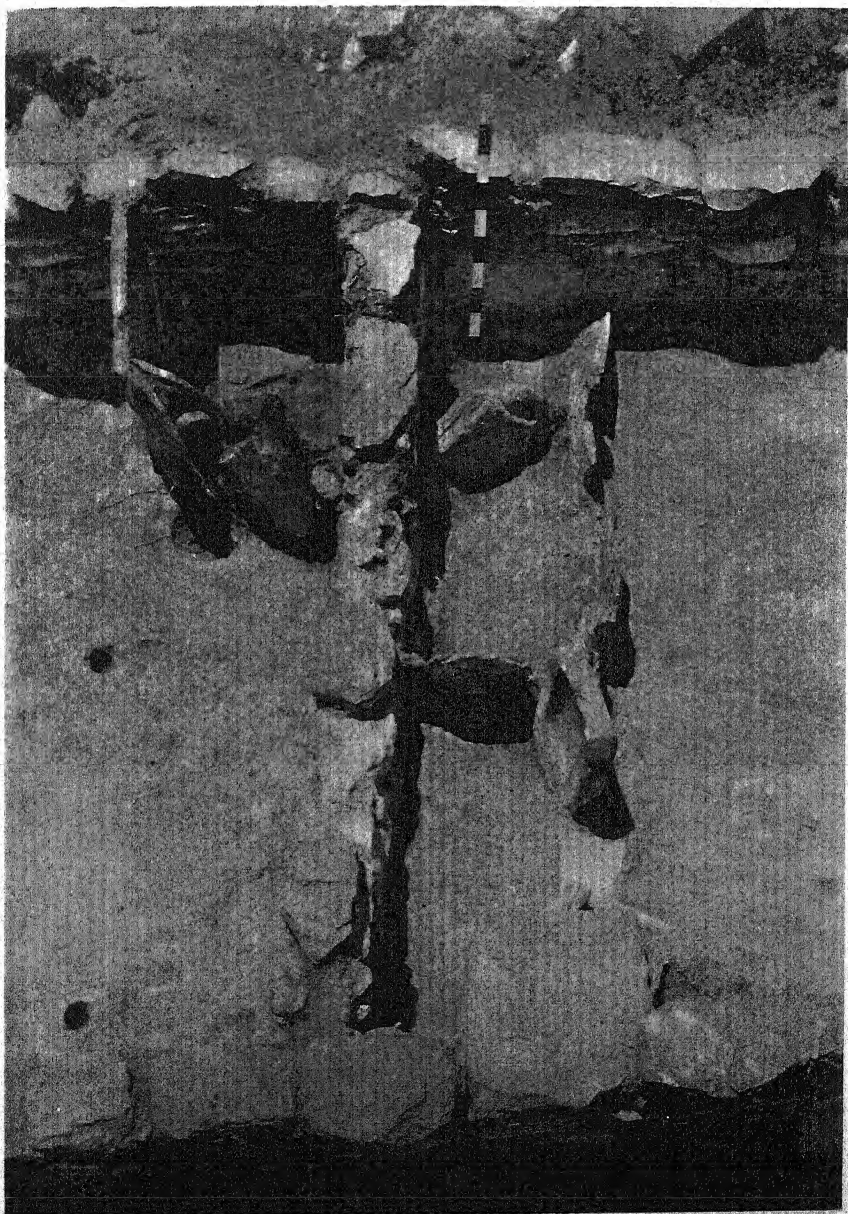


FIG. 70. Site 1, House Group II. Bins in Rooms 8 and 12; looking south. Note upright metate in right foreground. Meter stick in background.

PIT HOUSE A, SITE 1

(Figs. 71-73 and Map 14)

Shape.—Round.

Walls of native earth, plastered with adobe, and bed-rock (west half of pit house sunk through rock).

Partition Walls.—None.

Floor of smoothed adobe laid on bed-rock. Approximately 90 cm. below old ground level.

Firepit circular; rim of small rocks covered with adobe plaster.

Deflector.—Sandstone slab, set upright; edges chipped; 49 cm. high; 32 cm. wide.

Ventilator.—Lateral type (opening in wall). Too small to be used as entryway. Tunnel walls lined with vertical stone slabs; roof of slabs, held up by four short beams; one roof slab projecting into room held up by four short posts, two on either side of ventilator opening. Floor of tunnel sloped slightly upwards. Shaft lined with rocks (not masonry) and some slabs; very short.

Sipapu.—Not found.

Cists two in number, in northeast quadrant; in floor; small and shallow (about 15 cm. deep).

Post-holes forty-four in number; in pit-house floor; thirty-six in the periphery and six in east half. Depth ranged from 2 cm. to 21 cm.; diameters, from 6 cm. to 20 cm. Charred posts in each post-hole.

Roof.—Exact character not known. Probably upper ends of posts were forked, providing a rest for stringers. Pit house very shallow; therefore a goodly portion of walls must have projected above the ground level. Walls and roof heavily mudded with adobe, as considerable burned adobe bearing beam impression found in fill and on floor.

Pottery.—Predominant types: Lino gray, Kana-a gray, Abajo red-on-orange (see Chapter IV).

Dates.—A.D. 868, 870, 872.

General Comments.—Pit House A destroyed by fire. Entrance must have been through the roof. On west side of pit house and on old ground level a retaining wall(?) and seventeen post-holes. The significance of these features is unknown, although they may have been posts of some crude shelter. Just outside of "retaining wall" was a small firepit.



Fig. 71. Site 1, Pit House A. Post-holes, cists in floor, firepit with adobe collar, deflector (between firepit and ventilator tunnel), charred posts at left. Arrow (50 cm. long) points magnetic north; meter stick in ventilator shaft.

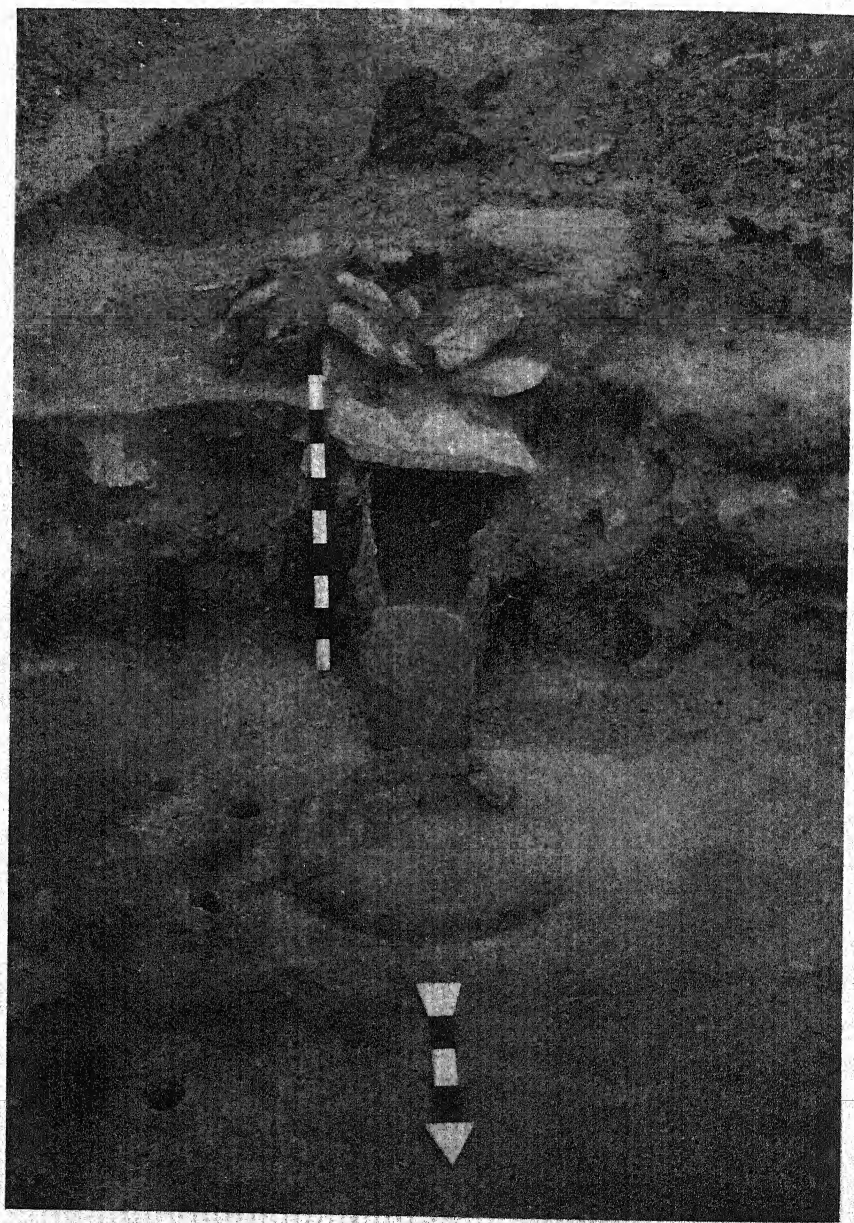
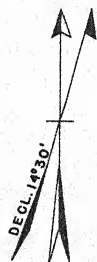


FIG. 72. Site 1, Pit House A. Detail showing firepit with adobe collar, deflector, and ventilator tunnel. Arrow (50 cm. long) points magnetic north; meter stick in background.

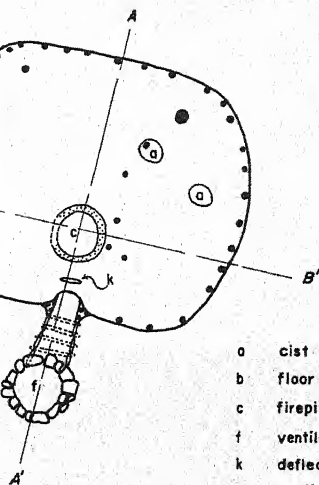


Retaining Wall

B

POST HOUSE

c



- o cist
- b floor
- c firepit
- f ventilator
- k deflector
- a posthole
- fill
- adobe

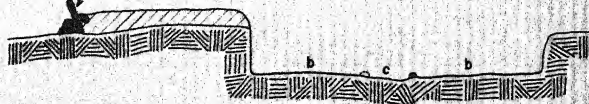


SECTION A A'



Retaining Wall

SECTION B B'





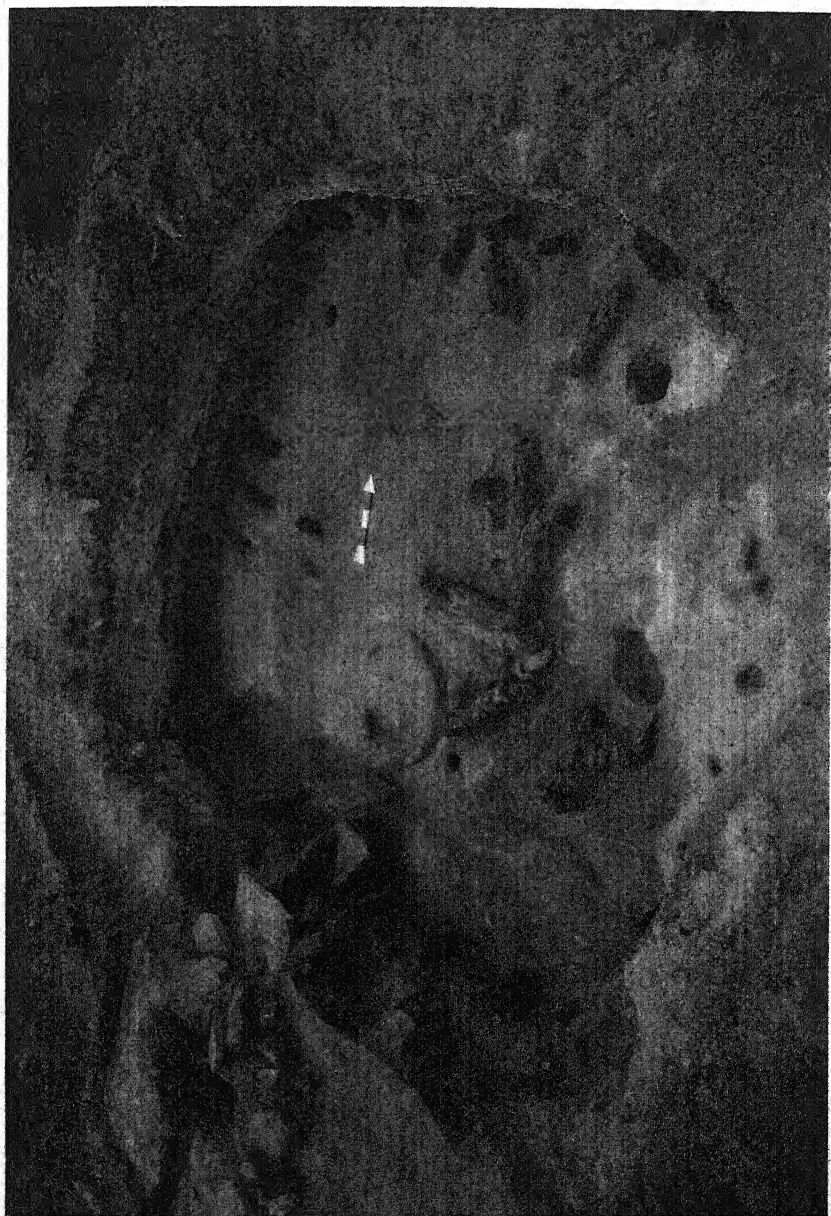


FIG. 73. Site 1, Pit House A. Charred roof beams and roof supports *in situ*. Arrow (50 cm. long) points magnetic north.

PIT HOUSE B, SITE 1

(Figs. 74-76 and Map 15)

Shape more or less round.

Walls of native earth, plastered with adobe, and of bed-rock in some places (portions of pit house sunk through rock).

Floor of smoothed adobe laid on bed-rock; near west wall, of bed-rock. About 90 cm. below old ground level.

Partition Walls in south portion of house. Walls not continuous; break or doorway about 1.5 meters wide directly opposite (north of) ventilator. Built of masonry through-stone construction; masonry completely covered by thick adobe plaster. Original height, 70 cm.; thickness, 25 cm. Roof post incorporated in each wall.

Firepit circular; sides lined with six vertical sandstone slabs coated with fine brown sand, tops of slabs projecting above floor about 2 cm.

Deflector.—Sandstone slab set upright in groove cut in floor; 46 cm. high, 31 cm. wide.

Ventilator (see also below under *Antechamber*) of peculiar type. During occupation, a kind of double ventilator had been built in passageway to antechamber. Near deflector, a bin-like box of slabs and masonry erected, with fresh-air opening at top. Farther south, in passageway, a small tunnel-like opening (50 cm. wide and 40 cm. high) was built. No *sipapu*.

Cists two in number, in east half, shallow (about 16 cm. deep), small; diameter of one about 33 cm.; dimensions of other 55 cm. long, 45 cm. wide. Larger one filled with fine brown sand and topped by stone slab.

Post-holes sixty in number; in house floor; fifty-two in periphery next to walls; four placed without apparent order; one in center of each quadrant. The last had held the main roof supports, diameters of which were 16 cm. and depths, 31 cm. and 22 cm. The remaining post-holes varied from 6 to 10 cm. in diameter, with an average depth of 10 cm. Four post-holes filled with sand; the rest contained charred stub-ends of posts.

Roof.—Exact character not known. Tops of main posts were probably forked, thus providing a rest for main stringers. The upper ends of posts set in periphery may also have been crotched, thus supporting short logs which may have extended from forks to main stringers. Other poles probably slanted up from ground level inwards and rested on poles supported by posts set in periphery. This entire framework was then undoubtedly covered with small sticks and adobe. Since pit house was shallow, portion of roof must have projected above ground level.

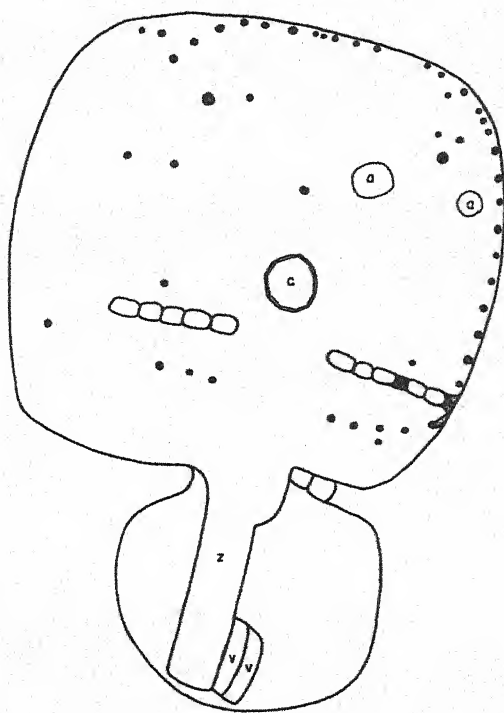
Antechamber (see also above under *Ventilator*).—Passageway, 65 cm. wide and about 85 cm. high, led out of house at floor level and sloped upwards into antechamber proper. Floor of antechamber 60 cm. above floor level of house; walls of native earth and bed-rock. Antechamber irregular in shape; large, about 3.5 meters in diameter. Undoubtedly roofed (burned logs and burned adobe bearing beam impressions found in fill and on floor) but just how, not known. Probably used as entryway before reduction in size.

Pottery.—Predominant types: Lino gray, Kana-a gray, Abajo(?) red-on-orange.

Artifacts.—See Chapter III; also, a fragment of basketry, coiled with non-interlocking stitches on a two-rod-and-bundle triangular foundation.

Dates.—A.D. 855 to A.D. 869.

General Comments.—Pit House B destroyed by fire. Entrance originally through southern antechamber; later, probably through hatchway in roof. Charred beans, corn, and matting found on floor.



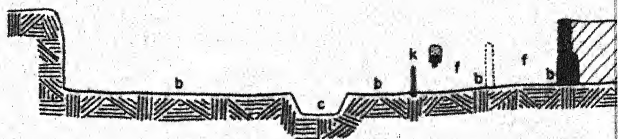
Before alterations



B

After alterations

SECTION AA'



SECTION BB'





FIG. 74. Site 1, Pit House B. As originally constructed, showing southern antechamber in background, partition walls running east and west, post-holes in periphery, and firepit in center. Floor damaged by rodents. Arrow (50 cm. long) points magnetic north; meter stick in background.



FIG. 75. Site 1, Pit House B. Showing addition of masonry in front of and in southern antechamber. Entrance into southern antechamber now blocked by addition. Arrow (50 cm. long) points magnetic north; meter stick in background.

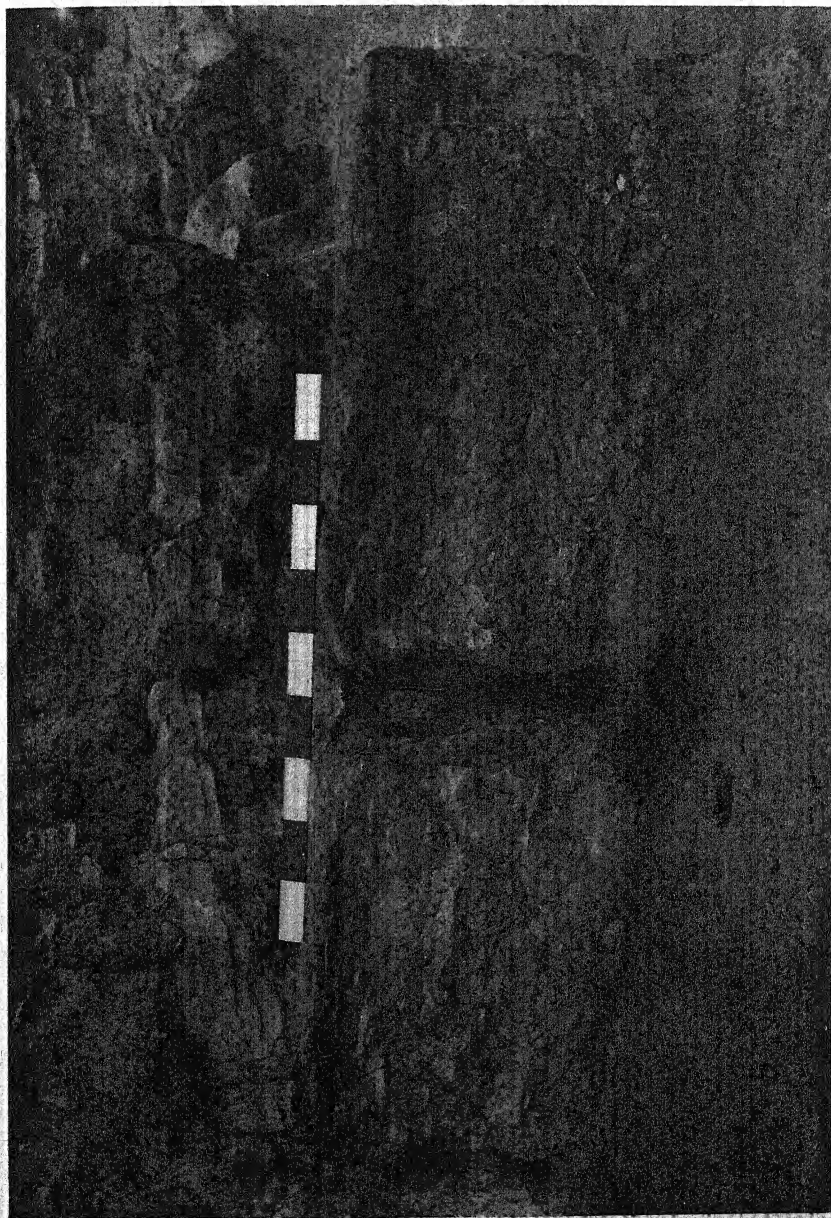


FIG. 76. Site 1, Pit House B. North side of east partition wall, which consists of through-stone masonry covered with mud plaster; wall intact, charred post in center. Meter stick on top of wall.

PIT HOUSE C, SITE 1

(Figs. 77-79 and Map 16)

Shape more or less round.

Walls of native earth, of bed-rock, through which house had been sunk, and of masonry; all plastered with adobe.

Bench(?) consisting of natural(?) ledge or offset in bed-rock, in west zone. On bench crude masonry erected, to make entire west wall flush from top to bottom.

Niches(?) ten in number; eight in west wall; two in east. All were round; about 30 cm. above floor, 9 cm. deep, and 10 cm. in diameter. Nothing was found in any of them. Purpose unknown.

Floor of native earth, plastered with adobe, and of bare bed-rock. About 1 meter below old ground level.

Partition Walls in south portion of house. Walls not continuous, but had opening or break about 2 meters wide directly north of ventilator. Built of slabs, adobe, and crude masonry. Original height probably about 70 cm.; thickness not known exactly. Roof posts incorporated in each wall.

Firepit originally circular; diminished in size by filling in west half. North and west sides of upright sandstone slabs; other two sides of native soil. Firepit lined with fine brown sand; contained much wood ash. An adobe collar on east, northeast, and south.

Deflector not found. Place for one noted, consisting of groove cut in bed-rock.

Ventilator (see also below under *Antechamber*) of crude masonry, of later construction, placed in southern antechamber and passageway. Masonry of unworked pieces of sandstone, varying in size from 23 by 20 by 3 cm. to 52 by 22 by 8 cm.; six to ten courses high. No spalls. Mortar between courses 5 to 8 cm. thick.

Sipapu.—None.

Cists four in number, in floor; three circular; one oval. All fairly small and shallow. Two of these holes entirely filled with fine brown sand, one covered with two thin, worked sandstone slabs. Also one cist in wall.

Post-holes forty-three in number; in house floor, mostly in periphery, but a few placed without apparent order here and there. Twelve of the forty-three had been filled with fine brown sand and served no constructional function. Those placed in periphery averaged 10 cm. in diameter and 13 cm. in depth. In the center of each quadrant was a post-hole, the average diameter being about 20 cm. and the average depth, 17 cm. All these holes, except the twelve filled with sand, contained charred butts of upright posts.

Roof.—Exact character not known. Probably similar to that of Pit House B.

Antechamber (see also under *Ventilator*).—Passageway, 77 cm. wide, led out of house at floor level and sloped upwards into antechamber. Floor of antechamber about 20 cm. above house floor. Walls, on three sides, of native earth; on fourth or south side, of crude masonry. This masonry forms part of wall of Pit House D; therefore does not properly belong to Pit House C. Antechamber about 2 meters square. Probably was roofed, as post-holes were found in floor; but character of roof unknown.

Pottery.—Predominant types: Lino gray, Kana-a gray, Abajo red-on-orange (see Chapter IV). *Artifacts*.—See Chapter III.

Date.—A.D. 858.

General Comments.—Pit House C destroyed by fire. Entrance originally through southern antechamber; later, probably through hatchway in roof. Charred beans and corn found on floor.

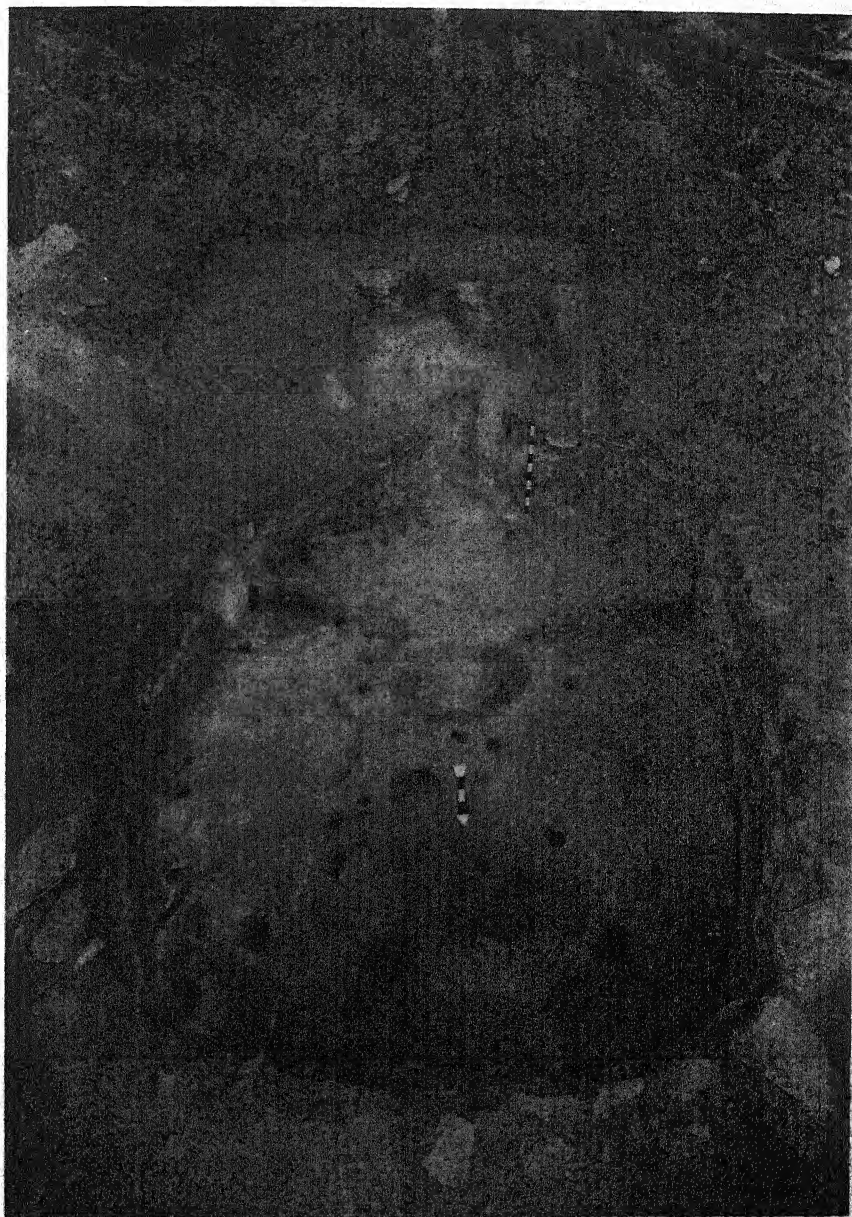
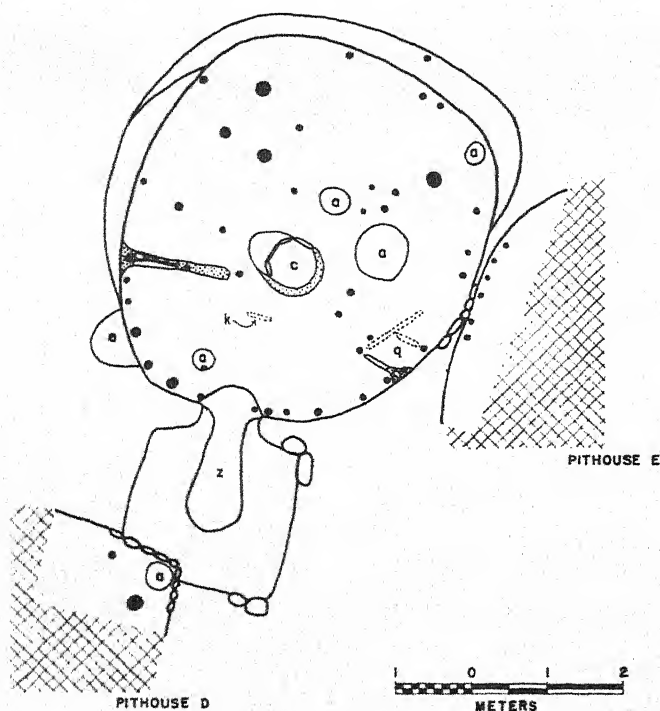


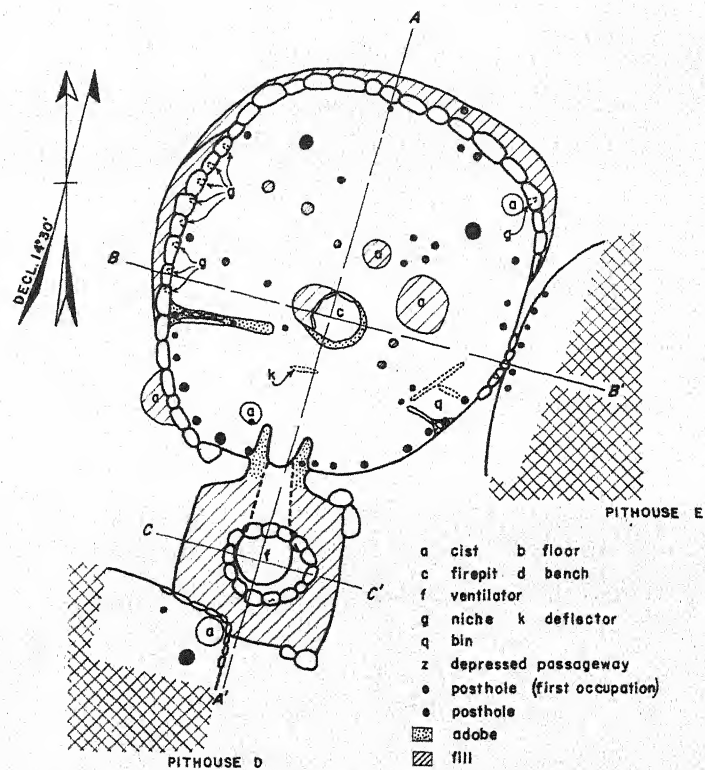
FIG. 77. Site 1, Pit House C. As originally constructed, showing southern antechamber in background, partition walls running east and west, post-holes in periphery, miscellaneous holes in floor, and double firepit. Arrow (50 cm. long) points magnetic north; meter stick in background.



FIG. 78. Site 1, Pit House C. Showing addition of masonry ventilator shaft in southern antechamber, and reduction in entryway. Arrow (50 cm. long) points magnetic north; meter stick in background.

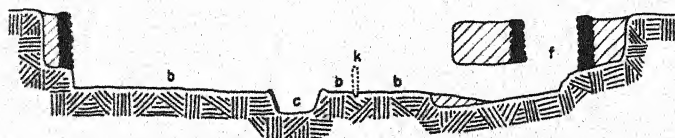


Before alterations



After alterations

SECTION AA'

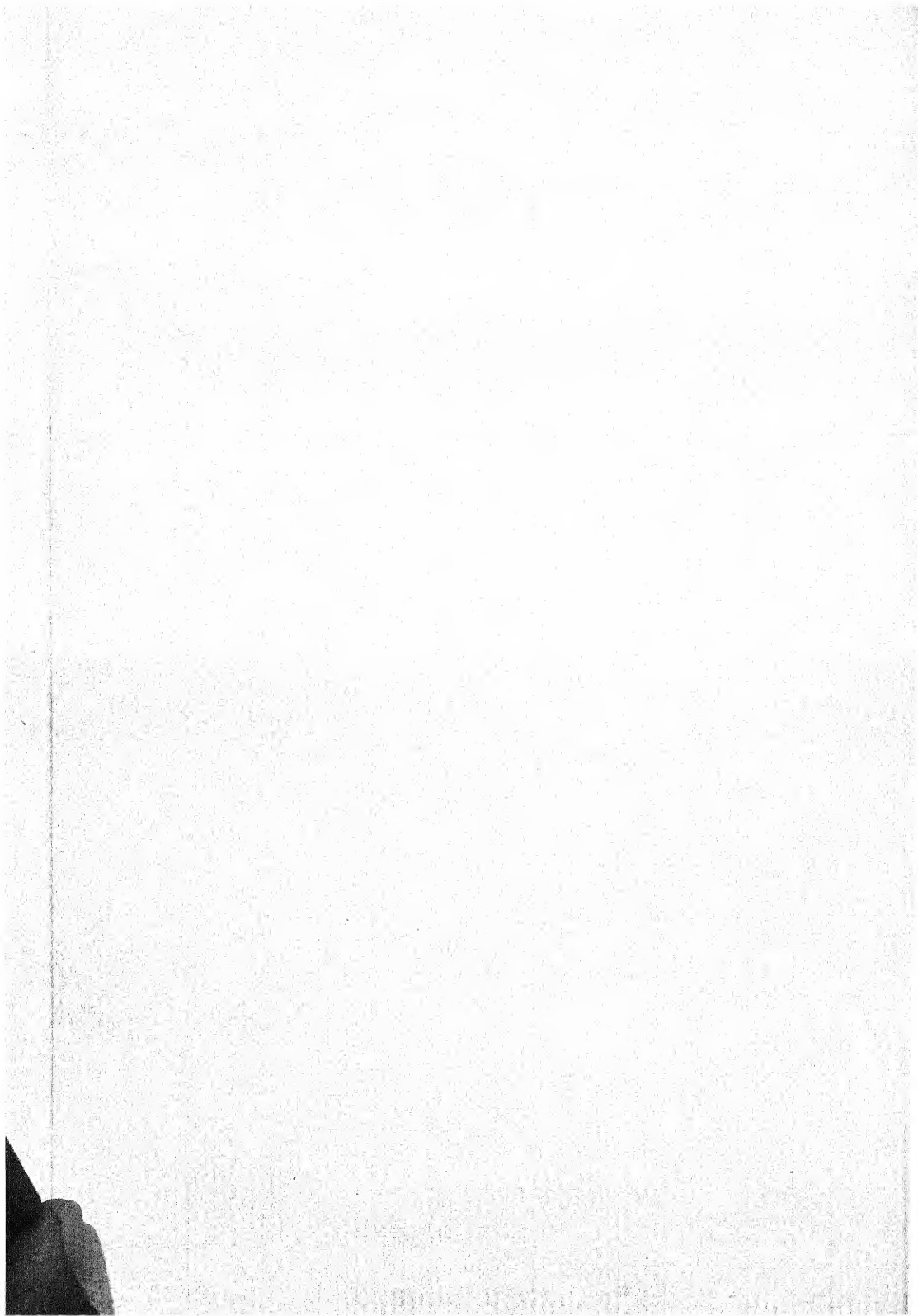


SECTION BB'



SECTION CC'





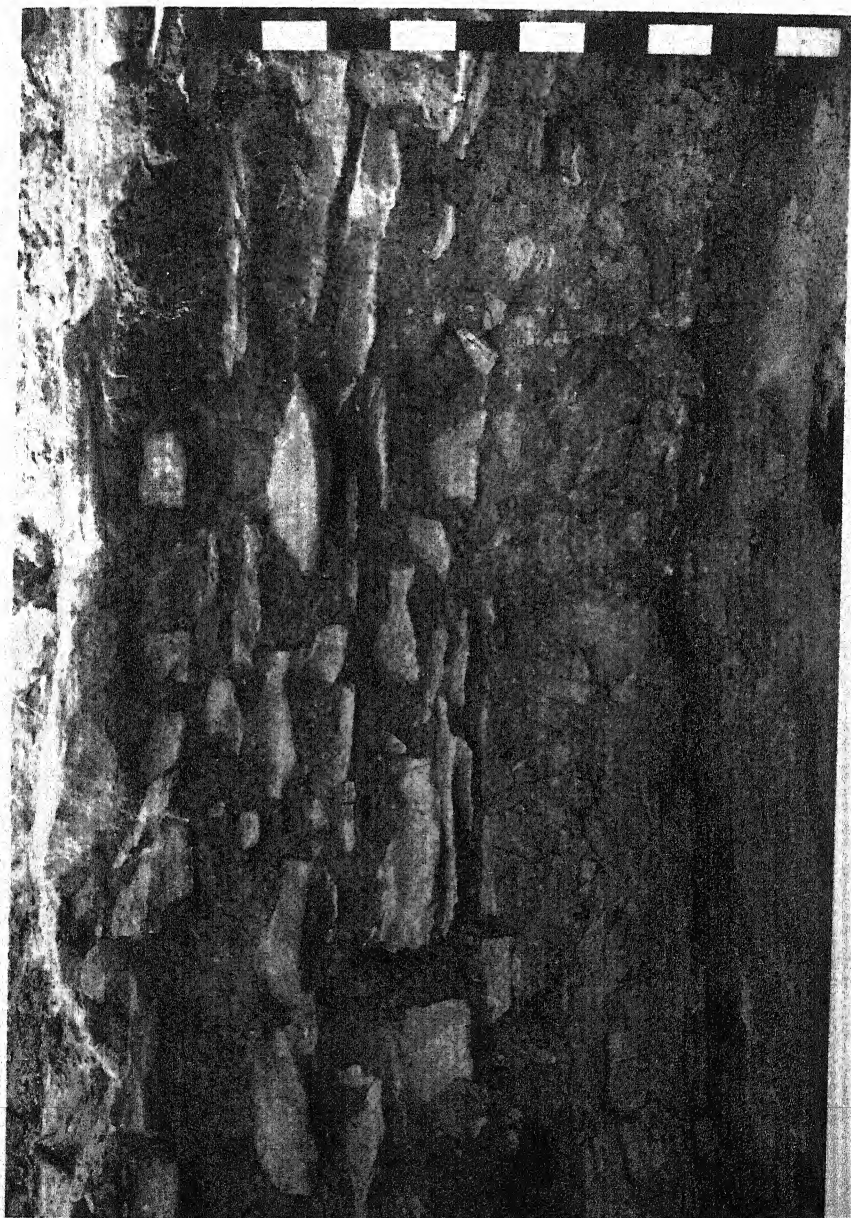


FIG. 79. Site 1, Pit House C. Secondary masonry walls, northwest quadrant. Meter stick at right.

LESSER GREAT KIVA(?) I, SITE 1

(Figs. 80-82 and Map 17)

This large round structure lay north of House Groups I and II and Pit Houses A-E; south of unexcavated rooms and pit houses. Three peripheral rooms were excavated.

Shape.—Round; inside diameter above bench, 13.17 meters.

Walls of masonry; laid without foundations, on bed-rock. Stones undressed slabs of sandstone, all fairly large; largest stones, 80 by 55 by 18 cm.; smallest, 25 by 12 by 3 cm. Average thickness of wall, 1 meter. Very few spalls. Mortar of local brown adobe; untempered; thickness varies from 3 cm. to 13 cm.; average, 4.5 cm. Original height of wall (estimated), 2 meters (great quantities of wall stone in fill). Height, when excavated, two to eight courses; greatest height of standing wall, 1 meter; least height, 50 cm.

Bench.—Face of bench of vertically placed sandstone slabs; seat of long slabs, laid horizontally. Depth varies from 53 cm. to 87 cm. Height varies from 25 cm. to 45 cm.; average, about 37 cm.

Niches.—None.

Stairway.—None.

Floor of hard-packed, smoothed adobe; on old ground level (i.e. not sunk into ground like pit houses). In northeast quadrant, fill had been packed in to make a level floor. This condition made it impossible to locate post-holes in that area.

Firepit.—None found.

Deflector.—None found

Ventilator.—None.

Sipapu.—None.

Cists three in number; in floor; one rectangular, two circular. The rectangular cist lay approximately where one would expect a firepit. The walls and floor of this cist were of sandstone slabs. The two circular cists were merely small depressions in the floor. None showed evidence of fire, or contained any pottery or artifacts.

Post-holes(?) twelve in number. Central post-holes varied in diameter from 15 to 20 cm., and in depth, from 8 to 15 cm.; that in southwest quadrant hollowed out of bed-rock. Post-holes in periphery varied in diameter from 8 cm. to 11 cm.; in depth from 9 cm. to 15 cm. No wood, charred or decayed, was found in any of these holes.

Roof.—Character unknown. In fact, it is doubtful if this structure was ever roofed.

Antechamber.—None.

Pottery.—Predominant types: Lino gray, Kana-a gray, and Abajo red-on-orange (see Chapter IV).

Artifacts.—See Chapter III.

Dates.—Since no wood was found, no dates were obtained. This structure is probably of the same age (since pottery is the same) as the houses and pit houses.

General Comments.—This structure is called "Great Kiva" partly because of its size and partly for want of a better term. It was essentially an above-ground structure.



FIG. 80. Site 1, Great Kiva I. Showing cist in southern zone. Three-meter stick in center; meter stick in peripheral room in background; arrow (50 cm. long) points magnetic north.

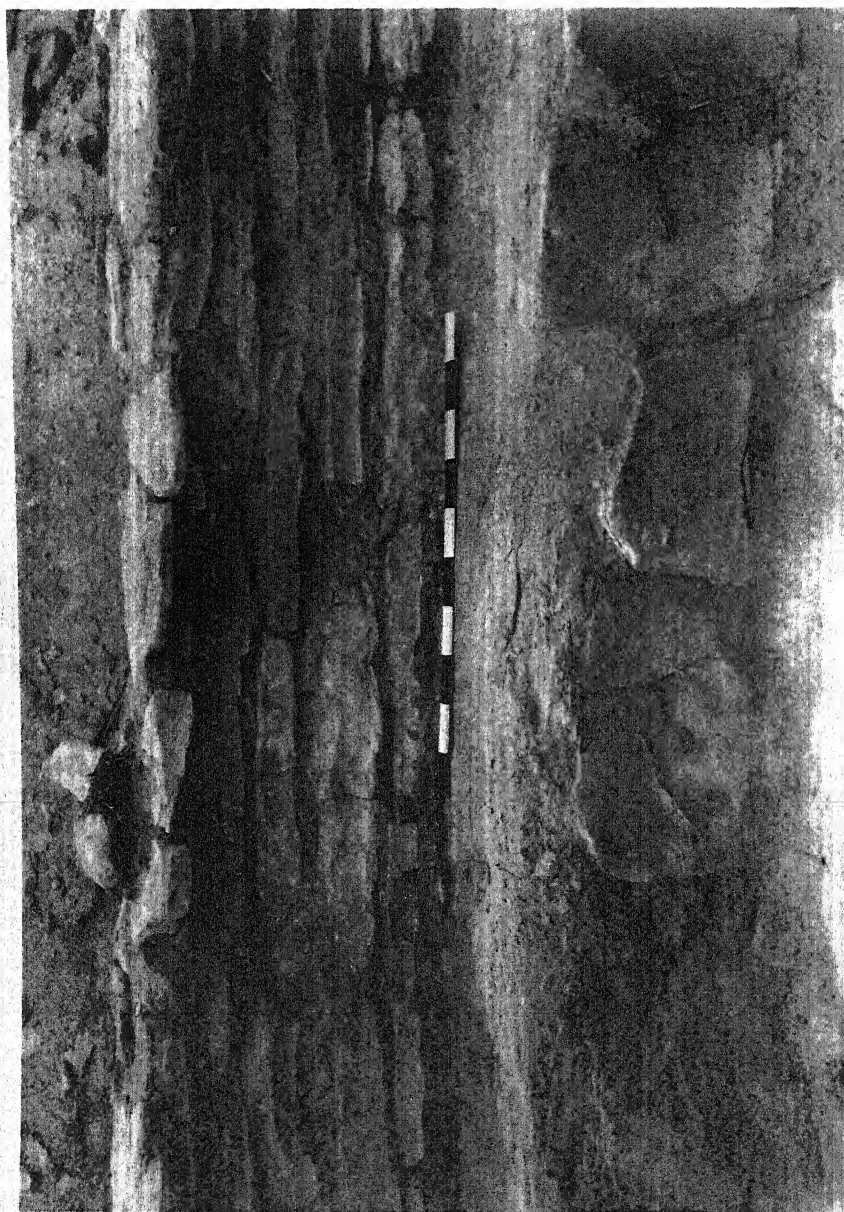
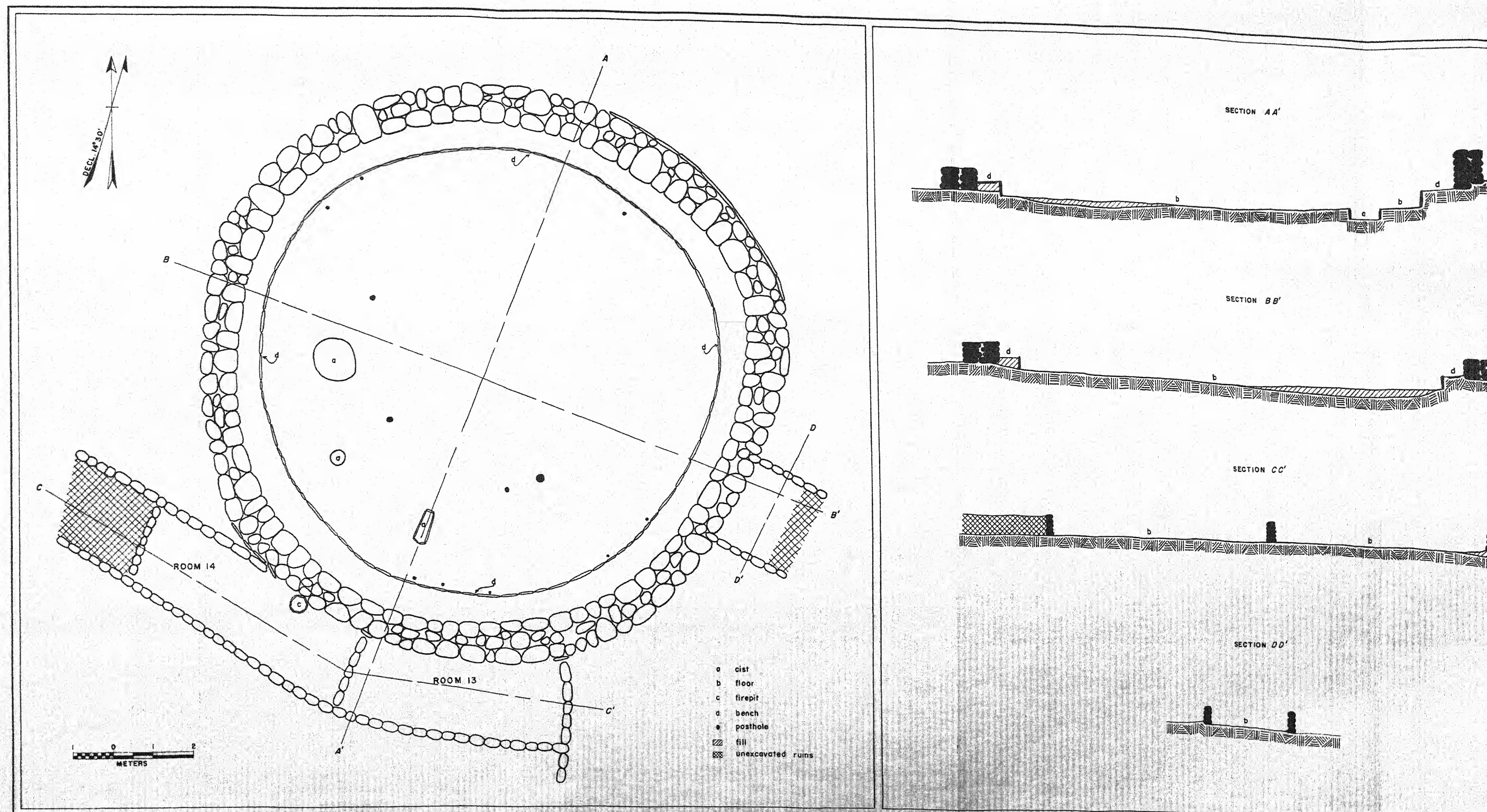
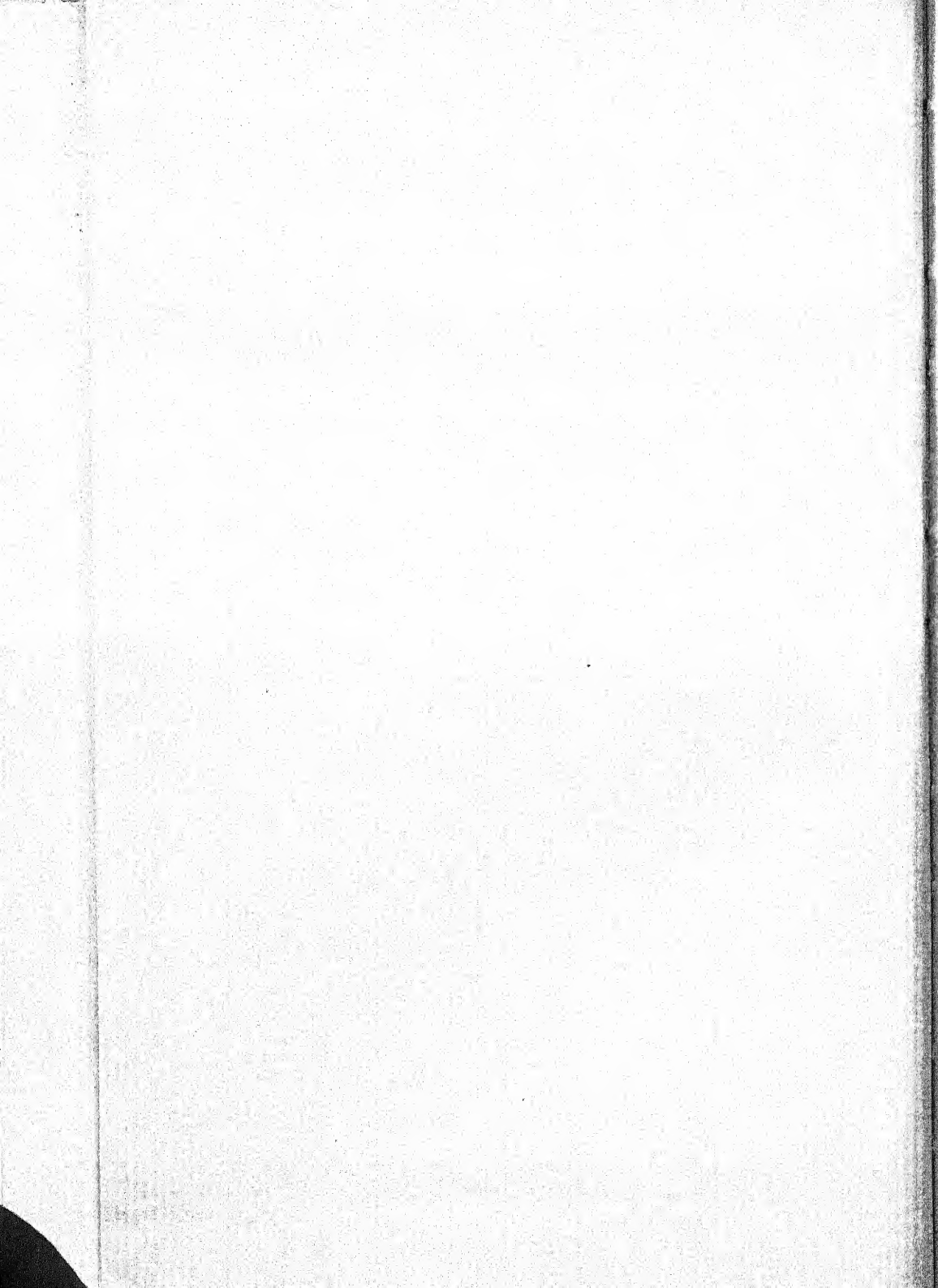


FIG. 81. Site 1, Great Kiva I. Showing portion of bench and outer wall in southern zone. Meter stick on bench.



MAP 17. GROUND PLAN AND SECTIONS OF GREAT KIVA 1 AND PERIPHERAL ROOMS, SITE 1



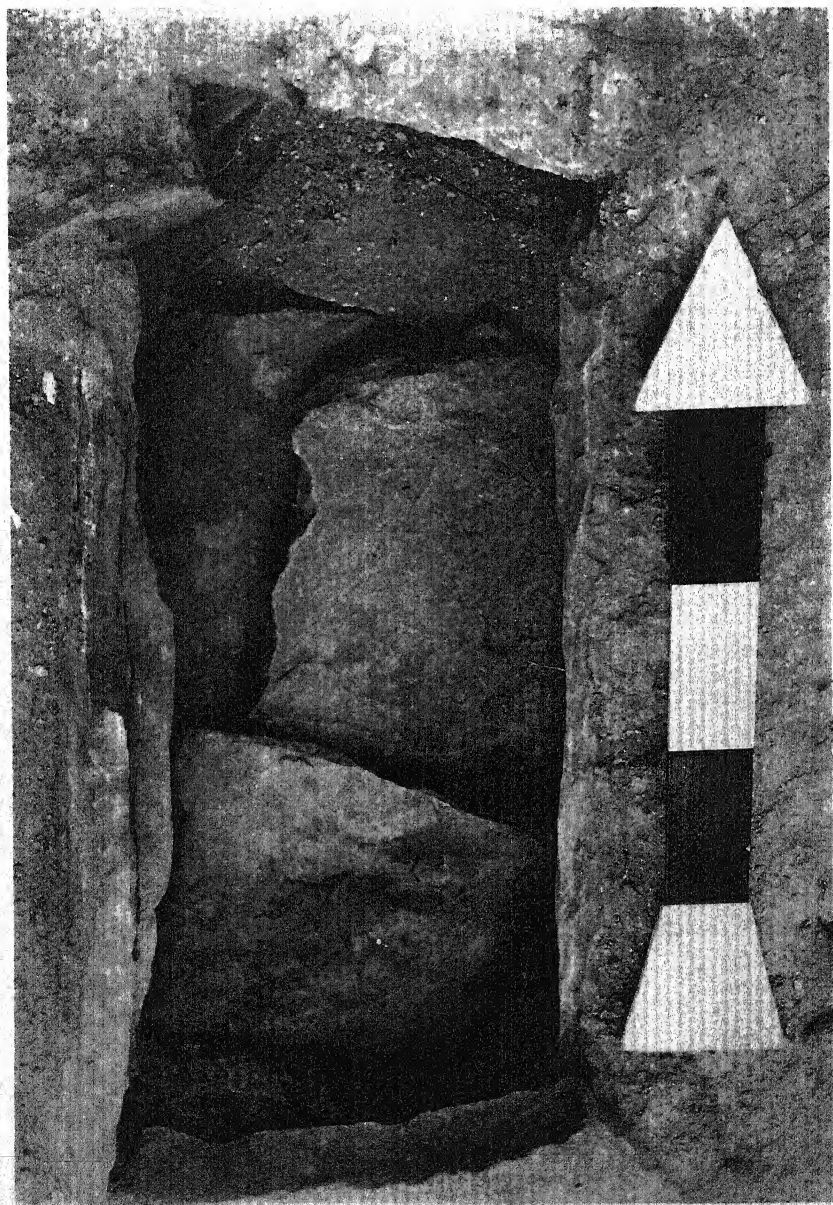


FIG. 82. Site 1, Great Kiwa I. Slab-sided cist in floor of southern zone. Arrow (50 cm. long) points magnetic north.

PERIPHERAL ROOMS OF LESSER GREAT KIVA(?) I, SITE 1

(Fig. 83 and Map 17)

There were several rooms immediately adjacent to this kiva. These have been called "peripheral rooms," three of which were excavated, two on the south and one on the east. Trenches were dug all around the outside of this circular structure, but no rooms were found on the west or the north.

Walls laid without foundations on natural soil; of undressed sandstone rocks, average size about 38 by 25 by 7 cm. Masonry of through-stone construction. Walls of Room 15 bonded to kiva wall; walls of Rooms 13 and 14 abutted kiva wall. A few spalls of sandstone. Mortar of local, untempered clay. Original height of walls (estimated) 2 meters; height when excavated varied from 41 cm. to 95 cm.

Floors of smoothed adobe laid on bed-rock.

Firepit in Room 14, circular; sides lined with eight slabs; filled with ash.

Deflector.—None.

Ventilator.—None.

Cists and Bins.—None.

Post-holes.—None.

Roofs.—Character unknown. Roof beams may have rested on the tops of the walls, without any other supports.

Pottery.—Same as that found in kiva.

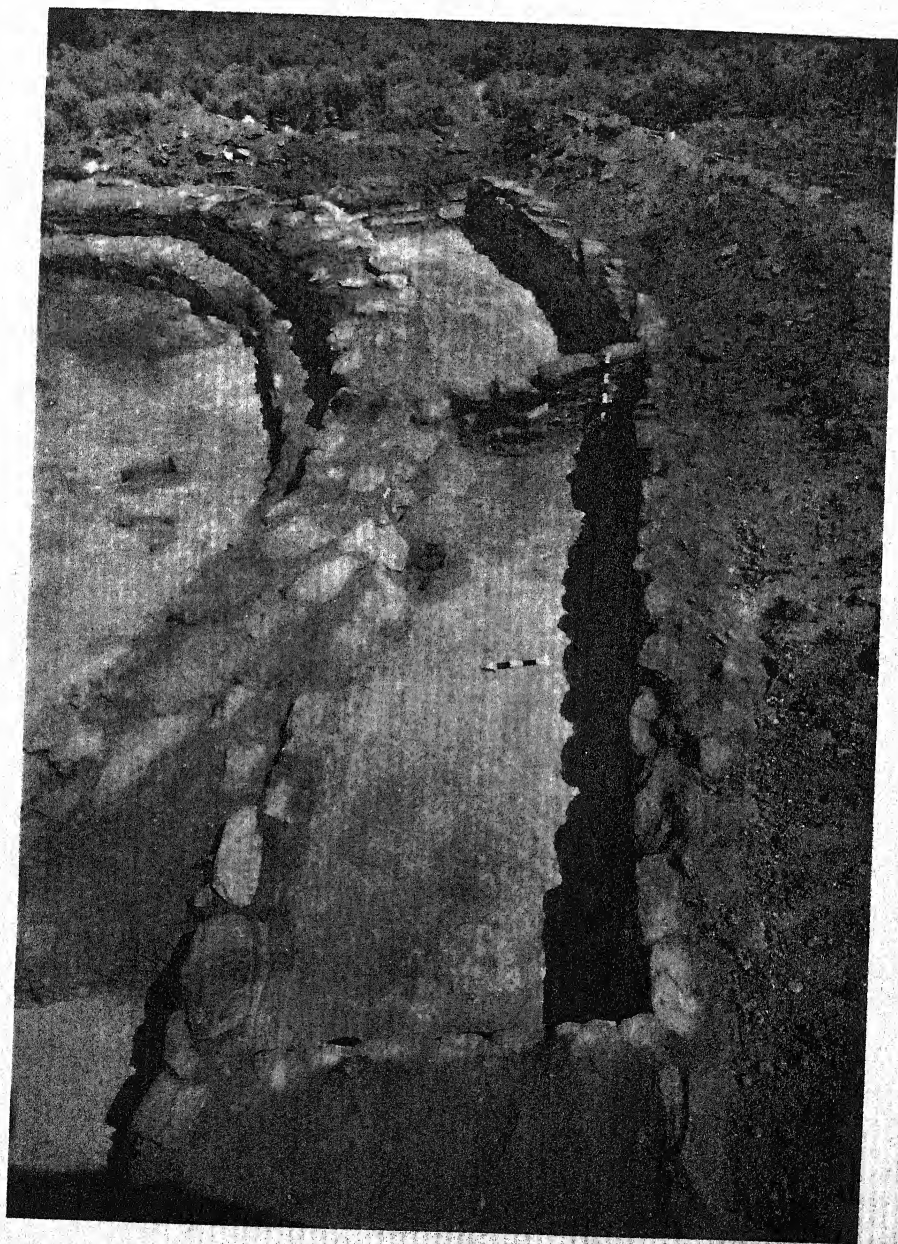


FIG. 83. Site 1, Great Kiva I. Peripheral rooms (Room 14 in foreground, 13 in background); firepit in left foreground of Room 14. Arrow (50 cm. long) points magnetic north; meter stick in background.

GREAT KIVA(?) II, SITE 1

(Figs. 84-86 and Map 18)

This large, circular structure lay about 200 meters south of Great Kiva(?) I, Pit Houses A to E, and superficial Rooms 1 to 12. There were no peripheral rooms.

Shape.—Round; greatest diameter, 24.9 meters; least diameter, 24.43 meters.

Walls.—Not of coursed masonry. Basal portion of sandstone slabs (133 in number), set vertically into a narrow trench, average depth of which was 22 cm.; width, 16 cm. Slabs fairly uniform in size, averaging about 70 cm. high, 50 cm. wide, and 8 cm. thick. Upper portion of crude rubble set in abundant mortar; rubble rested partly on top of slabs and partly on rocks and slabs laid on old ground level outside of kiva wall; thus, walls were probably about 30 cm. thick. (Same construction noted in 1937 [Martin, 1938, p. 241] and at Site 2, described herein, p. 362.) Excavations both inside and outside kiva for a distance of one to two meters produced many small rocks which were part of rubble wall (rest of fill merely wind- and water-deposited soil). From this evidence, original height of wall was probably about 1.5 meters. Greatest height, when excavated, 90 cm.

Bench.—None. *Niches*.—None. *Stairway*.—None.

Floor.—Not found. Fill at walls only about 50 cm. deep; in center of kiva, about 18 cm. Floor, which probably existed at one time, most likely destroyed by the elements. Bed-rock exposed in southwest and northwest quadrants and may have served as floor.

Firepit.—None found. *Deflector*.—None. *Ventilator*.—None.

Cists two in number (in floor); one in northeast quadrant, rectangular in shape, three walls of slabs and fourth of bed-rock; depth, 44 cm.; width, 57 cm.; length, 62 cm.; one projectile point and two Lino gray sherds. Second cist in northwest quadrant, shape of ten-pin laid down; walls partly of slabs (two) and partly of bed-rock; greatest length, 1.07 meters; greatest width, 65 cm.; least width, 33 cm.; depth, 32 cm.; contained nothing.

Post-holes seven in number, unevenly distributed: three in northeast quadrant, three in southeast quadrant, and one in southwest quadrant. The two largest contained no charcoal or fragments of wood; that in northeast quadrant measured 42 cm. in diameter and 24 cm. in depth; that in southeast quadrant, 35 cm. in diameter and 23 cm. in depth; around this post-hole small rocks had been placed. The other post-holes all contained bits of charcoal; their diameters ranged from 14 cm. to 18 cm. and their depths, from 10 cm. to 15 cm. All these post-holes are astonishingly small for such a large structure. No post-holes were found outside the slab wall.

Roof.—Character unknown. Since all post-holes are so small and since only one was found in southwest quadrant near wall and none in northwest quadrant, it is doubtful whether this structure was ever roofed. Every bit of soil on the floor was scraped down to bed-rock. I feel certain that we missed no post-holes.

Pottery.—Predominant types: Lino gray, Kana-a gray, Abajo red-on-orange, and La Plata black-on-orange (see Chapter IV).

Artifacts.—See Chapter III.

Dates.—None obtained.

General Comments.—The only justification for calling this structure a "Great Kiva" is that it is round and very large. No other kiva features were noted. In the center of the floor twenty-two slabs piled helter-skelter were found. The significance of these is not known. This kiva was entirely a superficial building.

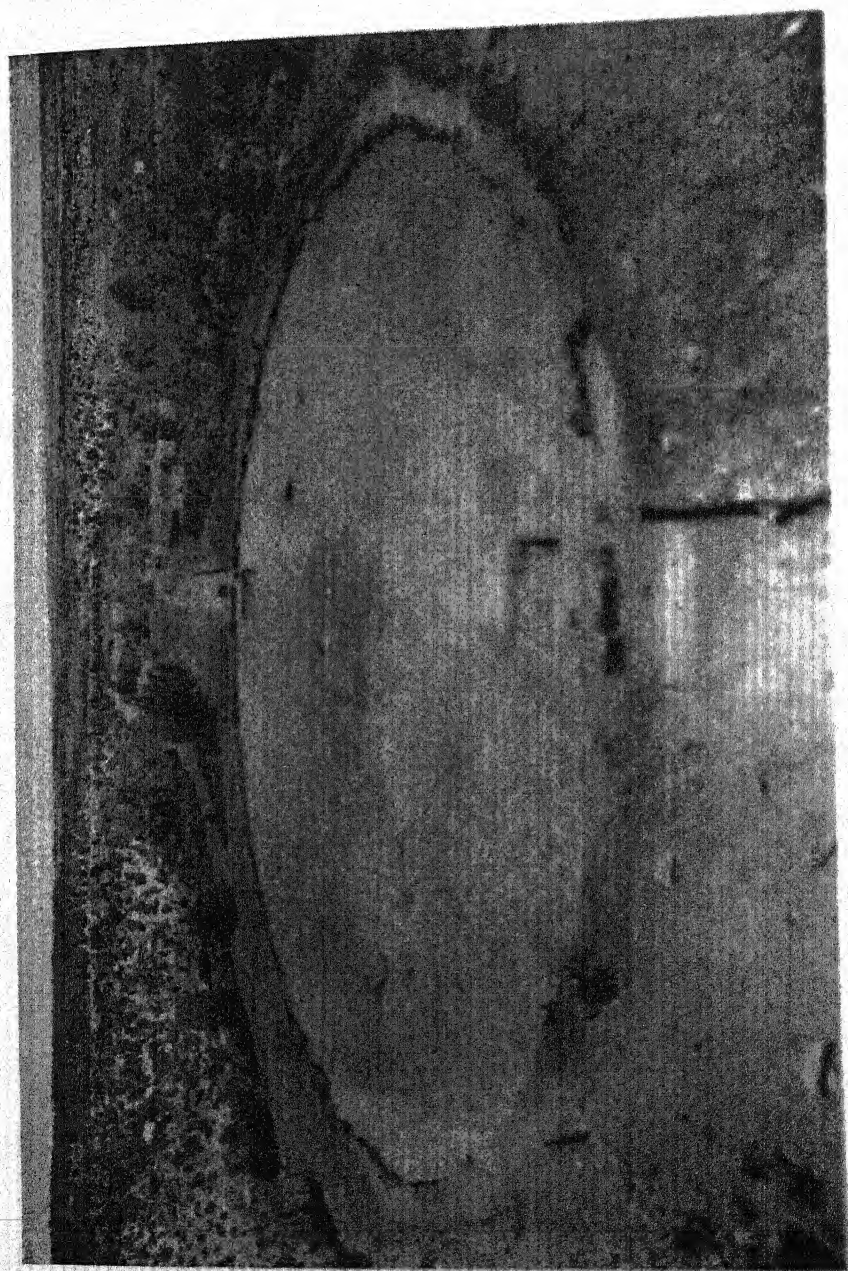


FIG. 14. Site 1, Great Key II, looking south. Euphorbia site at 11m (approx.) and 12m (approx.) are indicated. In northern quadrant. Three-meter stick is visible.



FIG. 85. Site I, Great Kiva II. Section of wall in southeast quadrant, showing upright slabs topped by rubble. Meter stick in foreground.

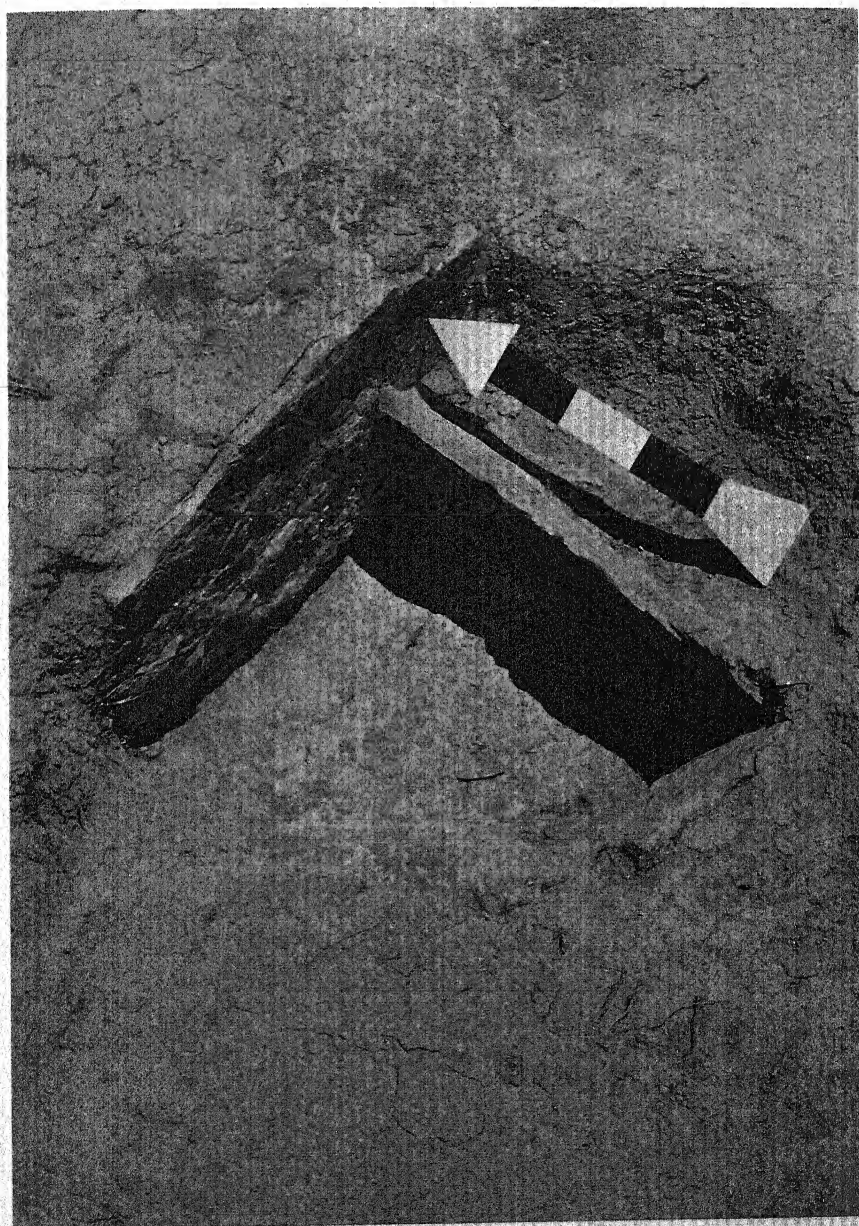


FIG. 86. Site 1, Great Kiva II. Slab-sided cist in northeast quadrant. Arrow, 50 cm. long.

SITE 2

Site 2 (NW $\frac{1}{4}$ of SW $\frac{1}{4}$ of Section 20, Township 39 N., Range 18 W., N.M.P.M., Montezuma County, Colorado) is located on a juniper- and pinyon-covered ridge, the drainage of which is to the north towards a small tributary of Cahone Canyon. This site is about 170 meters long.

The excavation of one-half of this (leaving the remainder for future investigators) occupied six weeks. During this period, we thoroughly investigated six pit houses, one peculiar, small, shallow subterranean chamber (F), sixty-one superficial rooms, and a large cist. A small pit house (E), discovered near the end of the season, was only partially excavated. In addition, twenty trenches, each 50 cm. wide, were dug to the north, west, south, and east of the ruin. These trenches produced an aggregate length of 125 meters. No burials were encountered in these investigations and only a little refuse, to the south of the pit houses.

The superficial rooms fell into three unconnected sections: an east wing, a central section (crescent-shaped), and a west wing. The axis of the village was more or less east to west.

These superficial rooms consisted of one-story aggregations built in two contiguous rows. The front row (the southern) was made up of rooms, the walls of which were constructed of upright poles and adobe; the walls of rooms in the rear row (the northern), were of upright slabs and rubble. In front of these rooms (that is, to the south) were the pit houses.

The absence of firepits in the rear row of rooms suggests that they were used only for storage of food; while the presence of firepits in the front row (pole- and mud-walled rooms) might indicate that these rooms were utilized as living quarters.

Rooms were numbered as they were excavated.

The slab-lined rooms were excavated in two levels, the upper one embracing all fill to within 5 cm. of the floor.

The pole- and mud-walled rooms were excavated in one level, since the fill was shallow and did not exceed 20 cm.

The fill above the floors in all the superficial rooms was sterile. Whole vessels, many sherds, and artifacts were found on the floors proper.

The pit houses, except Pit House D, were excavated in the same manner as were the superficial, slab-walled rooms, i.e., the upper level consisted of all fill to within 5 cm. above the floor, and the

lower level, the remainder of the fill (5 cm.). This was a reasonable procedure, because the fill in all pit houses (except D) was made up of wind- and water-deposited soil. Pit House D had been used as a dumping place, and was therefore excavated in a different manner (see description under "Pit House D").

It is interesting to note that whereas all the rooms and pit houses which we excavated at Site 1 had burned, only five surface rooms and one pit house at Site 2 had been destroyed by fire. This was unfortunate (for us) since unburned structures cannot be dated due to the lack of charred posts and roof beams.

However, we were lucky enough to find at Site 2 some pieces of wood which had been preserved by being charred. A few of these burned logs yielded dates (see Appendix D, by Harry T. Getty) which show that Site 2 (or at least some of it) was built about A.D. 760.

There was one notable exception. One log from Room 51 yielded a date of A.D. 612+x. Mr. Getty was not able to guess how many rings were missing, but he felt sure that this log was cut some time in the seventh century. This particular specimen, of course, must have been a re-used piece of wood since the date is at least a century earlier than any other at Site 2. The significant thing about this date is that somewhere nearby (and probably in a cave, because otherwise it would not have been preserved) was a dwelling which was erected some time in the 600's.

The people who built Site 2 probably found this deserted, ancient house and helped themselves to some of the logs. I believe this is one of the earliest dates from this portion of Colorado; obviously some people were living there earlier than I had guessed.

Details of Site 2 are contained in the following pages.

SUPERFICIAL ROOMS, SITE 2

(Figs. 87-91 and Maps 19, 20)

Two contiguous rows of rooms: front or southern one, probably used as living quarters; rear or northern one, for storage.

Walls of two types: (1) Of upright posts irregularly spaced from 15 cm. to 70 cm. apart, usual distance between posts being about 30 cm.; frequently with larger posts in corners; diameters of smaller post-holes varying from 6 cm. to 15 cm., and depths, from 10 cm. to 24 cm.; diameters of corner post-holes varying from 14 cm. to 27 cm., and depths, from 15 cm. to 30 cm.; spaces between posts plugged with adobe strengthened with reeds—or grass—binder (evidence from large pieces of burned adobe *in situ*); all post-holes contained charred butts or rotted fragments of posts. (2) Of sandstone slab foundation (slabs set vertically) with rubble atop; slabs varied in size from 25 by 45 by 4 cm. to 70 by 60 by 10 cm.; slabs projected above floor 35 cm. to 70 cm. Rubble rested either on double row of slabs set parallel about 10 cm. apart (space between slabs filled with rubble) or on special rock-and-slab foundation laid at base of slabs on outer side of wall (exactly like Great Kiva II at Site 1 [see p. 356], and like wall of superficial room encountered in previous year [Martin, 1938, p. 241]). Walls probably varied in thickness from about 10 cm. (rubble on parallel upright slabs) to 40 cm. (rubble on rock-and-slab foundation). Evidence from portions of two such walls *in situ* and from much rubble in fill. Original heights of walls, unknown; may have been 2 meters.

Doorways, two noted: one, in Room 16, in north wall, 25 cm. wide, formed by two slabs, each 30 cm. long; the other one(?) in Room 48, merely a gap (largest in room) between post-holes, 1.15 meters wide, in south wall. A similar gap, 70 cm. wide, south wall, Room 49.

Floors of hard-packed adobe, smoothed; in Room 1, of gypsum plastered on natural earth. In most instances at old ground level; in four rooms, 8 cm. to 40 cm. below old ground level.

Firepits (interior), fifteen found; fourteen circular, one oval. Pits vary in size from 33 cm. (diameter) by 12 cm. (depth) to 70 cm. (diameter) by 19 cm. (depth). All in front of south row; none in rear. Walls of eight, earth; of two, slabs.

Deflector(?), in Room 60, west of firepit, 75 cm. long, 23 cm. high; consisted of four slabs, two set in front of and parallel to others, placed 20 cm. apart. May not be a deflector. Also in Room 53, upright slab at south of firepit to protect(?) post wall.

Ventilators.—None.

Cists (interior), twelve found; circular; walls of natural earth; diameters ranged from 26 cm. to 1.9 meters, and depths from 15 cm. to 45 cm.

Bins, nine found; walls of one, adobe (Room 2); walls of remaining eight of slabs.

Post-holes.—One in each corner of slab-walled rooms. See also above under *Walls*.

Roofs.—Exact character unknown. Probably supported by posts (upper ends of which may have been crotched) and covered by small poles, twigs, and adobe.

Pottery.—Predominant types: Lino gray and Abajo red-on-orange.

Artifacts.—See Chapter III.

Dates.—Room 2, A.D. 763+x; Room 34, A.D. 768+x; Room 35, A.D. 762+x; Room 51, A.D. 612+x; and Room 56, A.D. 747+x.

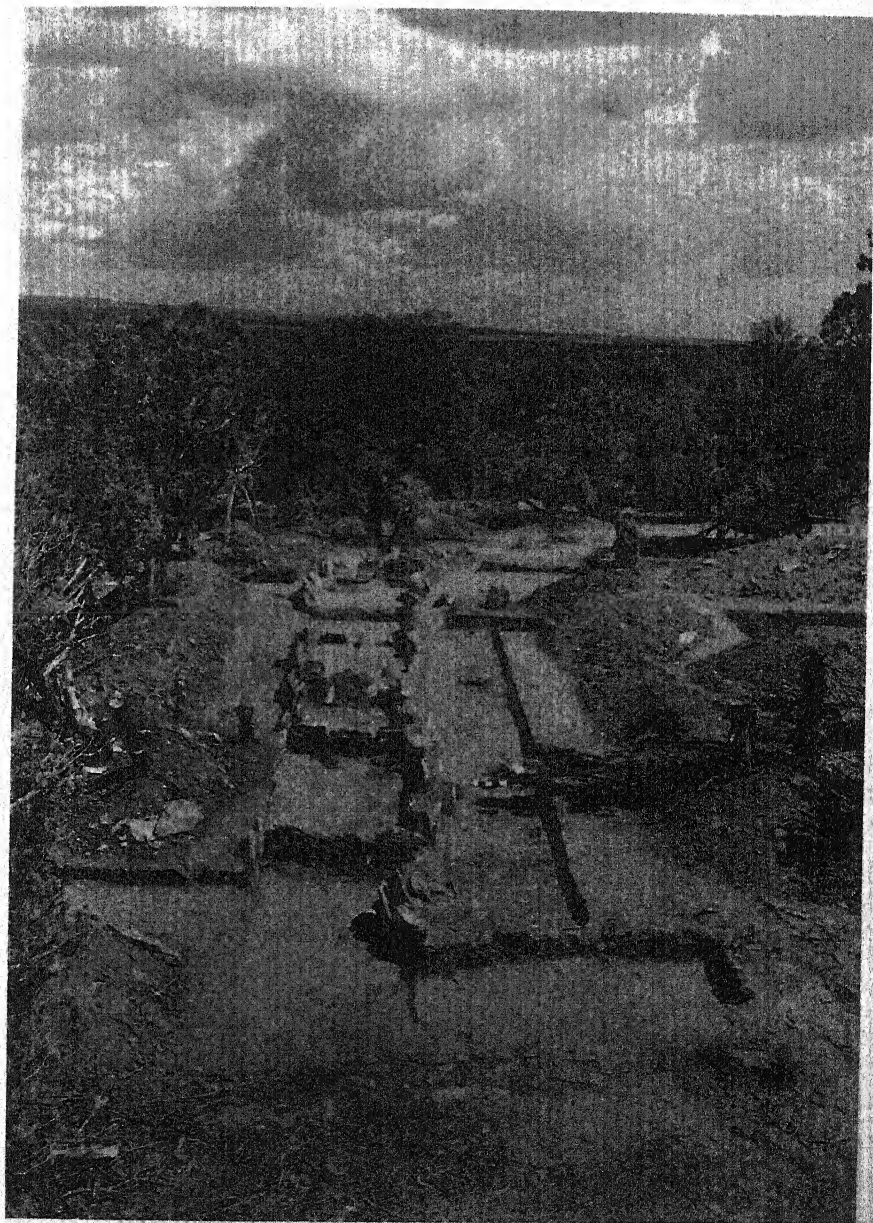


FIG. 87. Site 2, east wing; slab-walled surface rooms. Arrow (50 cm. long) points magnetic north; meter stick in background.

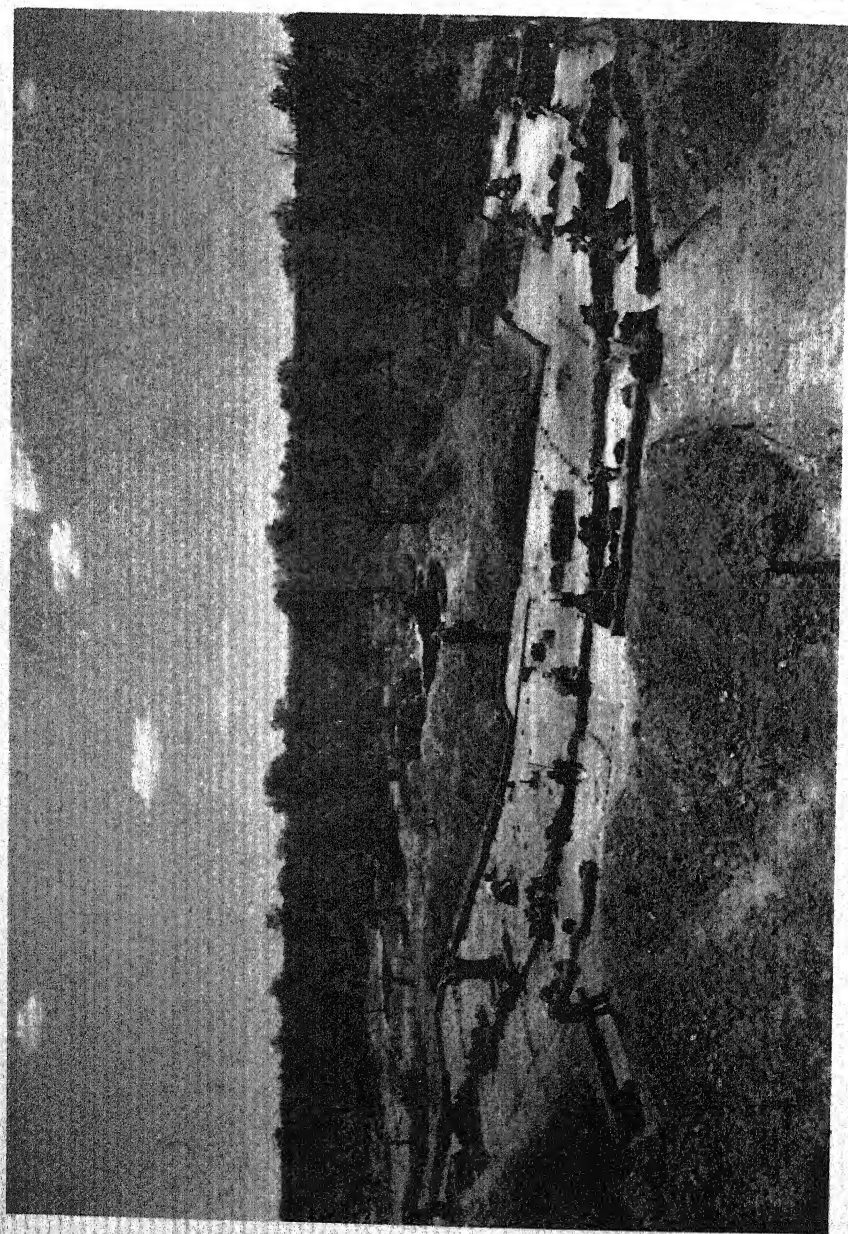


FIG. 88. Site 2, central section; looking southeast. Surface rooms, showing slab walls and post-holes. Pit Houses B and C in background.



FIG. 89. Site 2, Room 1. Showing (in foreground) single row of upright slabs backed by stones laid flat; this construction served as base for rubble wall. Arrow (50 cm. long) points magnetic north; meter stick in background.

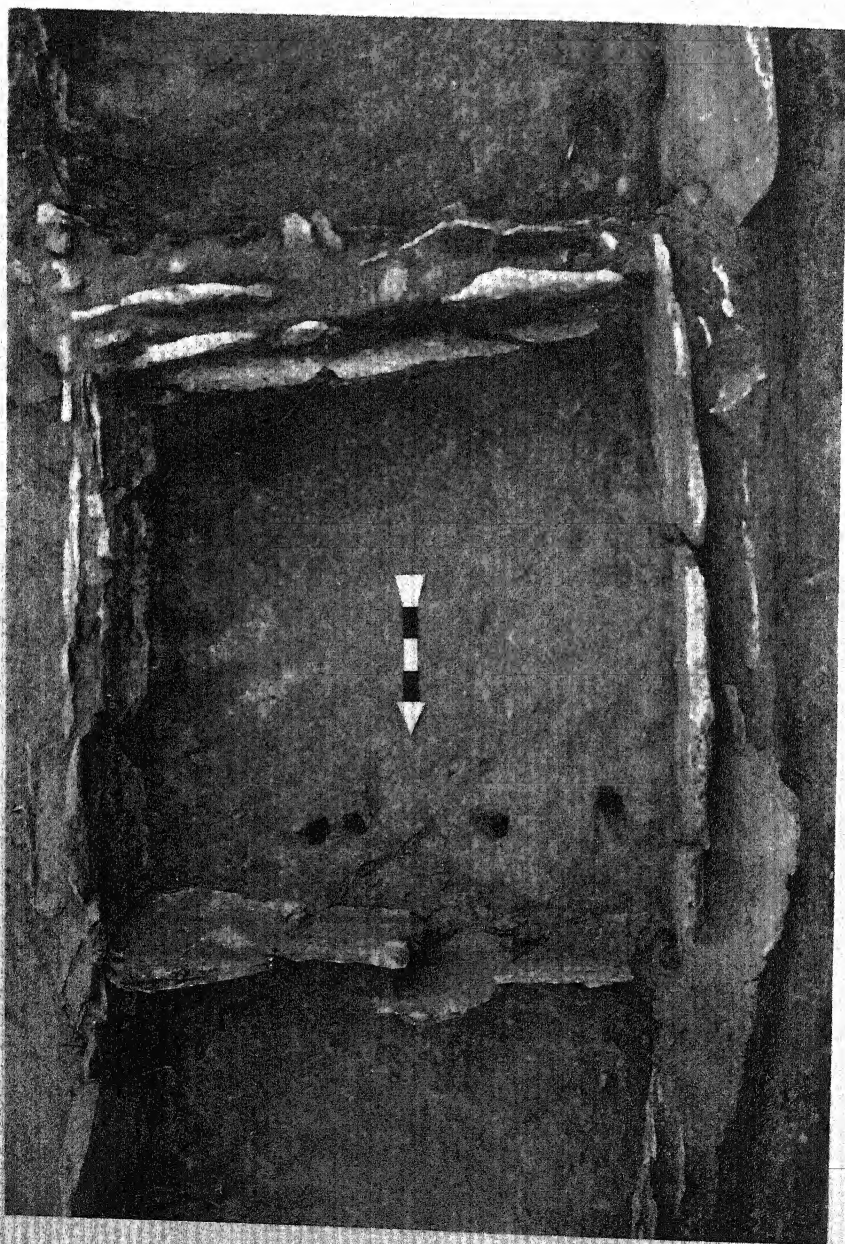
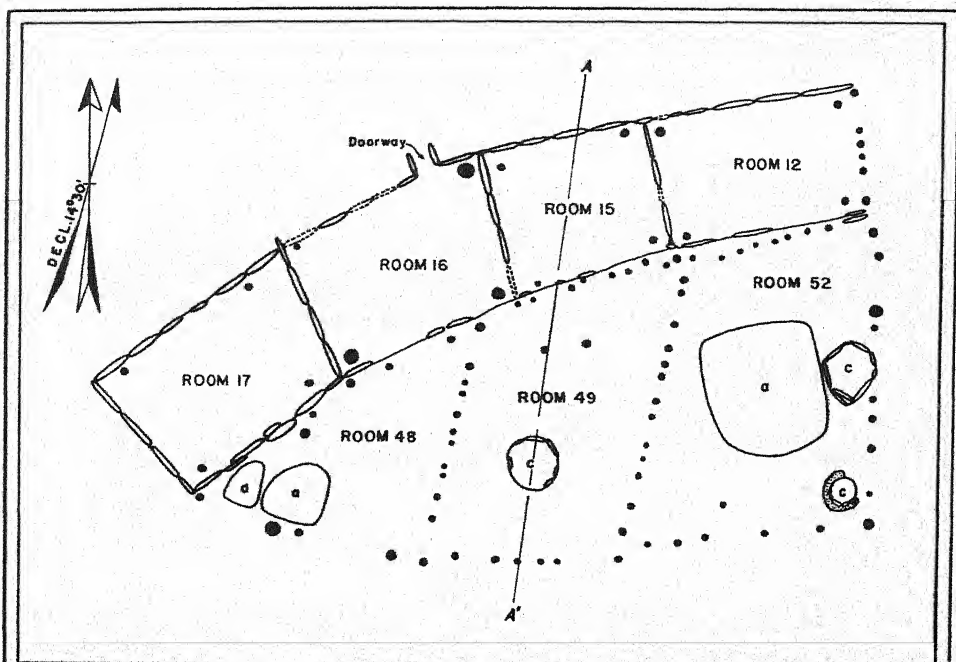
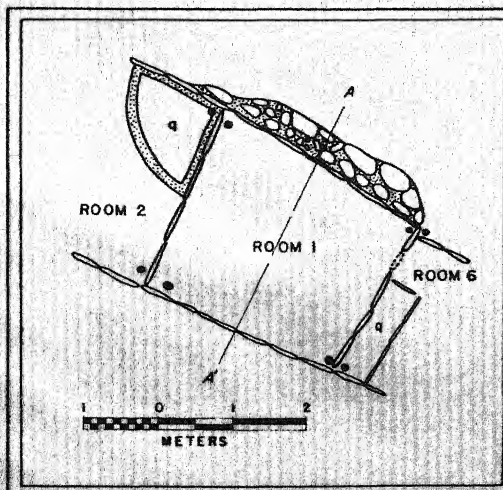


FIG. 90. Site 2, Room 24. Showing (on three sides) double row of upright slabs, space between slabs filled with rubble. This construction served as base for rubble wall. Arrow (50 cm. long) points magnetic north.



SECTION AA'



- a cist
- b floor
- c fireplace
- d bin
- e posthole
- fill
- adobe

SECTION AA'







FIG. 91. Site 2. Portion of central section; looking west at slab-walled storage rooms (at right) and pole-walled rooms (at left). In immediate foreground, adobe-collared firepit; just west of it, large cists; in background, two more firepits. Note triangular, pole-walled room in background. Arrow (60 cm. long) points magnetic north; meter stick in Room 17.

PIT HOUSE A, SITE 2

(Fig. 92 and Map 21)

Shape.—Square.

Walls of unplastered, native earth.

Bench.—None.

Niches.—None.

Floor, adobe plastered on gypsum outcrop; 1.7 meters below old ground level.

Partition Walls in south portion of house. Walls not continuous; break or doorway about 2.5 meters wide, south of firepit. When found, walls not intact. Built of posts and adobe. Original height about 65 cm.; when excavated, 61 cm. One principal roof post incorporated in each wall.

Firepit oval; hollowed out of gypsum stratum. Adobe collar, 3 cm. high and 10 cm. thick, placed around rim of firepit.

Deflector.—Sandstone slab set in groove in floor; 41 cm. high, 30 cm. wide, 3 cm. thick. Groove between firepit and deflector, 1.1 meters long, 17 cm. wide, 10 cm. deep; purpose unknown. May have supported a deflector at one time. Possibly groove for ladder to rest in.

Antechamber-entryway.—Passageway cut through natural earth; floor 17 cm. above pit house floor; width, 67 cm.; height, 70 cm.; length, 75 cm. Antechamber round; walls of native earth; approximately 2 meters in diameter. Undoubtedly roofed, but exact character of roof unknown.

Sipapu.—North of firepit were four small holes in line, any one of which might have been sipapu; perhaps all were. Holes contained no wood.

Cists two in number; in floor, east and west of firepit; both filled with sand to floor level. Dimensions of easterly cist: length, 78 cm.; width, 48 cm.; depth, 45 cm.; bell-shaped. Dimensions of westerly cist: length, 75 cm.; width, 45 cm.; depth, 23 cm. Neither cist showed evidence of fire.

Miscellaneous Holes five in number; in floor; all filled with fine sand flush with floor. May have served as pot-rests. Diameters ranged from 15 cm. to 30 cm.; depths, from 4 cm. to 16 cm.

Post-holes four in number, one in each quadrant. Diameters ranged from 20 cm. to 23 cm.; depths, from 58 cm. to 60 cm. No wood was found in any of these.

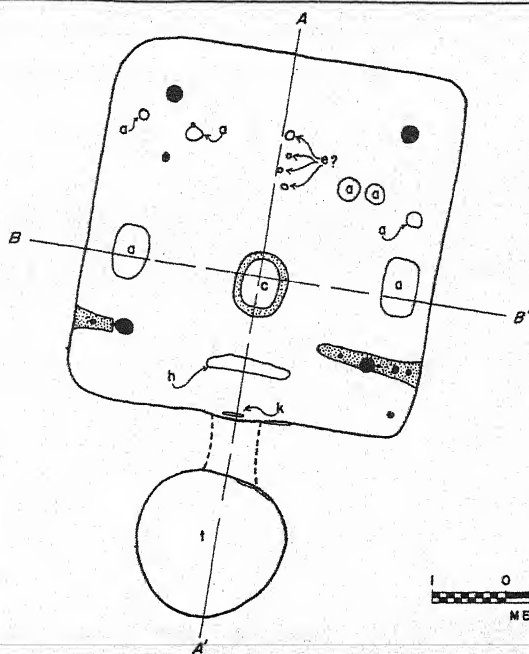
Roof.—Exact character unknown. Probably supported by four large posts, upper ends of which may have been forked, thus providing a rest for four main stringers. On frame thus formed, small poles were laid flat, covering central zone. Outer zone probably covered by small poles, inner ends of which rested on central framework; outer ends, on surface of ground.

Pottery.—Predominant types: Lino gray and Abajo red-on-orange (see Chapter IV).

Artifacts.—See Chapter III.

Dates.—Since no wood was discovered, no dates were obtained.

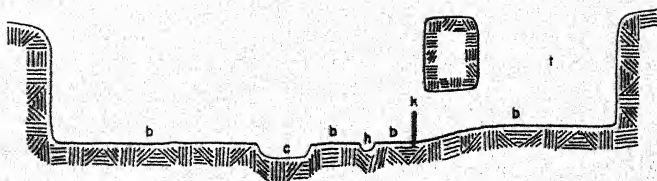
General Comments.—Pit House A did not burn.



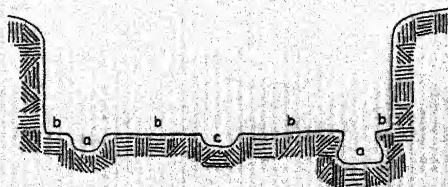
- a cist
- b floor
- c firepit
- e slpau
- h pit
- k deflector
- t antechamber
- posthole
- ▨ adobe

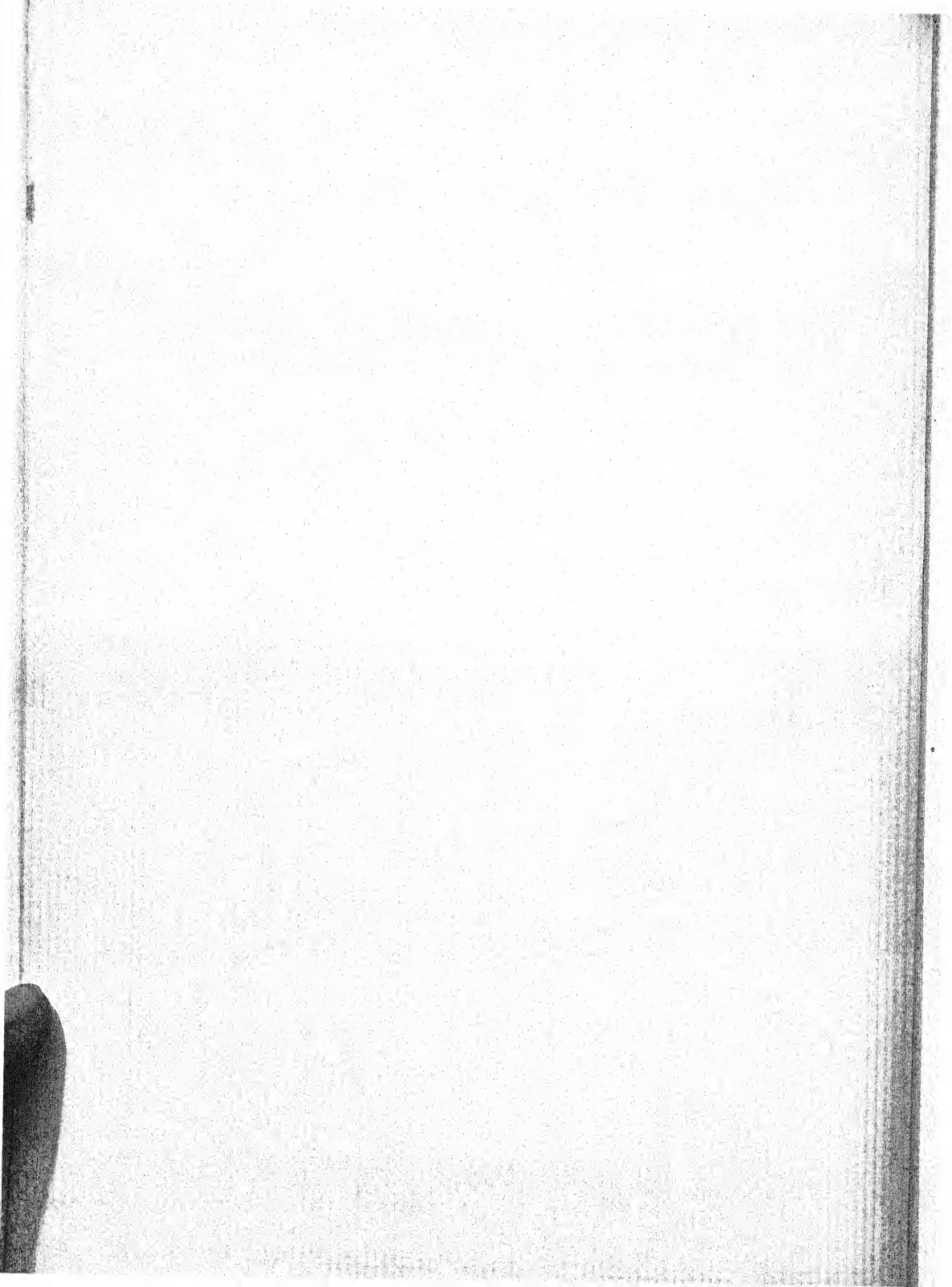


SECTION AA'



SECTION BB'





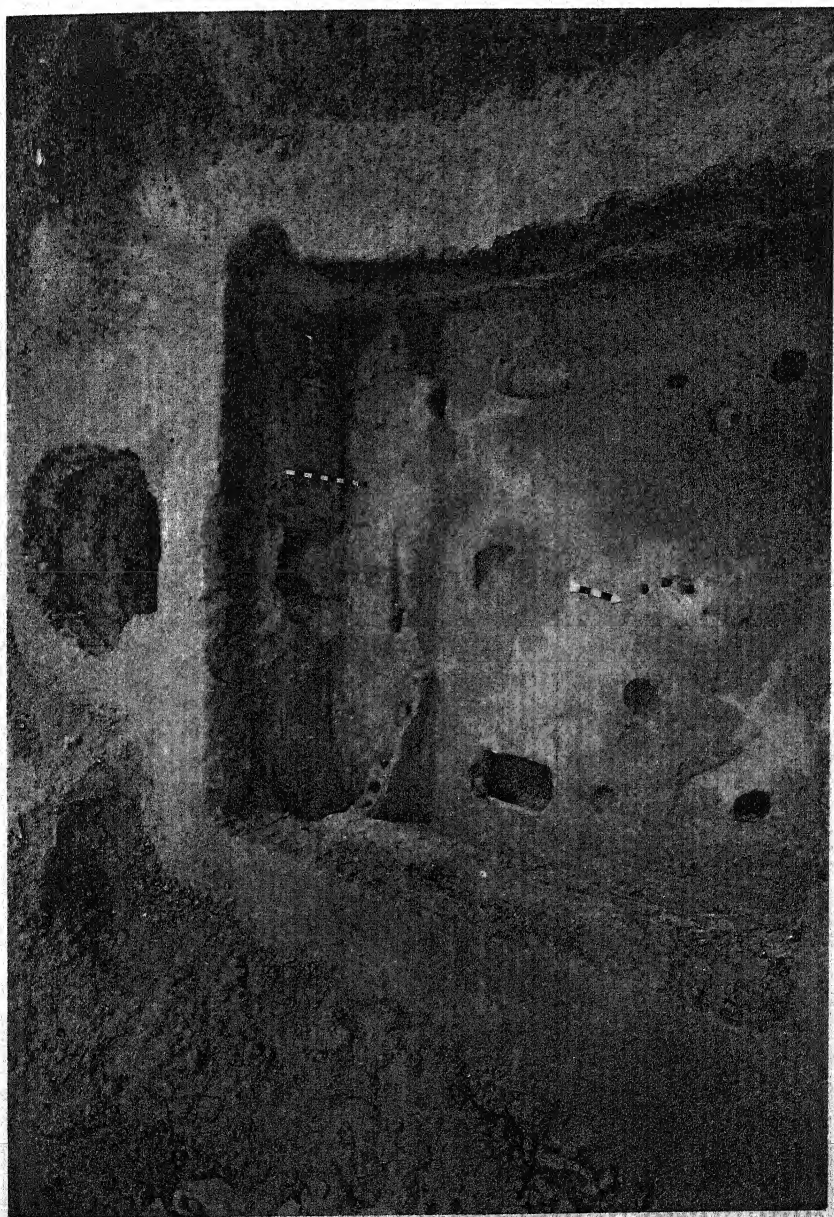


FIG. 92. Site 2, Pit House A. Showing four large post-holes, miscellaneous holes, large cists east and west of firepit, partition walls, and southern antechamber. Arrow (50 cm. long) points magnetic north; meter stick in background.

PIT HOUSE B, SITE 2

(Fig. 93 and Map 22)

Shape.—South side square; north side roundish.

Walls of unplastered, native earth.

Bench.—None.

Niches.—None.

Floor of smoothed and hard-packed adobe; 1.4 meters below old ground level.

Partition Walls in south portion of house. Doorway or opening south of firepit, 2 meters wide. Walls built of posts and adobe. Original height about 65 cm.; when excavated, greatest height 60 cm.

Firepit.—Originally circular, 80 cm. in diameter and 30 cm. deep; sides lined with sand. Later, two slabs (47 by 30 by 25 cm.) were set "V" fashion in original pit.

Deflector.—None.

Antechamber-entryway opened directly into pit house without any tunnel or passageway. Walls of native earth; floor slopes upward from pit-house floor. Approximately 3 meters by 2.5 meters. Roof supported by four posts, one in each corner.

Sipapu.—None.

Cists eight in number: (1) Near doorway of antechamber, slab-lined, 55 cm. by 48 cm., and 40 cm. deep. (2) Adjoining this, a circular pit, 40 cm. in diameter and 15 cm. deep. (3) Immediately south of firepit, a rectangular hole, 40 cm. long, 20 cm. wide and deep; lined with sand and filled with ashes, but showed no evidence of fire. (4) Bell-shaped cist north of firepit; diameter at top 35 cm., at bottom 58 cm.; depth, 55 cm. (5) Northeast of firepit and near wall, a cist-like hole in which were two smaller post-holes(?). (6), (7) and (8) Two small depressions lined with sand (pot-rests?) in northwest quadrant and one in southeast quadrant.

Ladder-holes(?).—Two found, just south of rectangular cist nearest firepit. Holes are 25 cm. apart, 12 cm. in diameter, and 5 cm. deep.

Post-holes, thirteen in number, in floor of pit house. In northwest quadrant, four; diameters range from 14 cm. to 28 cm., depths from 14 cm. to 22 cm. In northeast quadrant, six; range in diameter from 6 cm. to 30 cm. and in depth from 10 cm. to 25 cm.; largest post-holes were shallowest. South of west partition wall, two post-holes, diameters 10 cm. and 16 cm. and depths 10 cm. and 16 cm., respectively. South of east partition wall, one post-hole, 18 cm. in diameter and 12 cm. deep. Sand was found in all these post-holes, although not packed in up to floor level. Possibly sand was tamped around posts to hold them steady.

Roof.—Exact character unknown; undoubtedly supported by thirteen posts planted in post-holes described above.

Pottery.—Predominant types: Lino gray and Abajo red-on-orange (see Chapter IV).

Artifacts.—See Chapter III.

Dates.—Since no wood was recovered, no dates were obtained.

General Comments.—Pit House B did not burn.

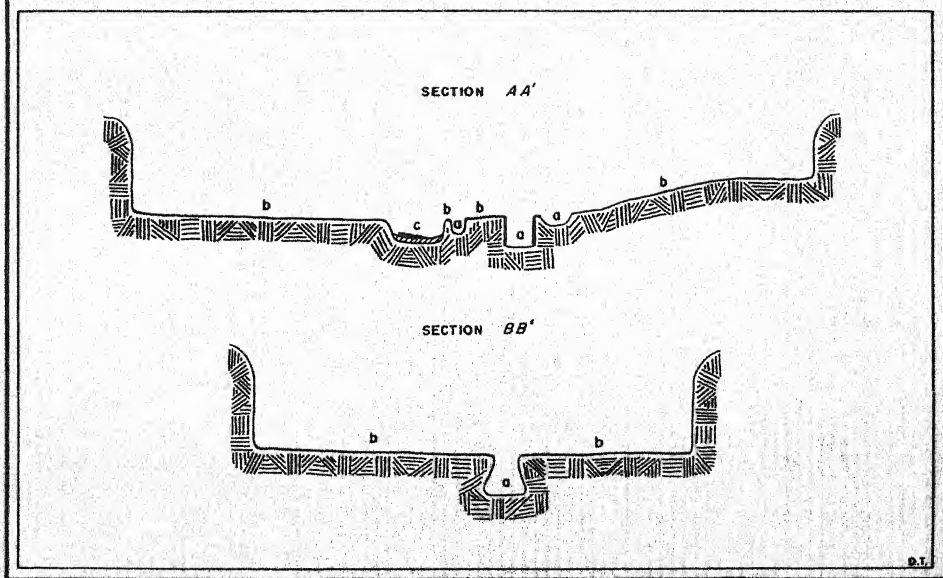
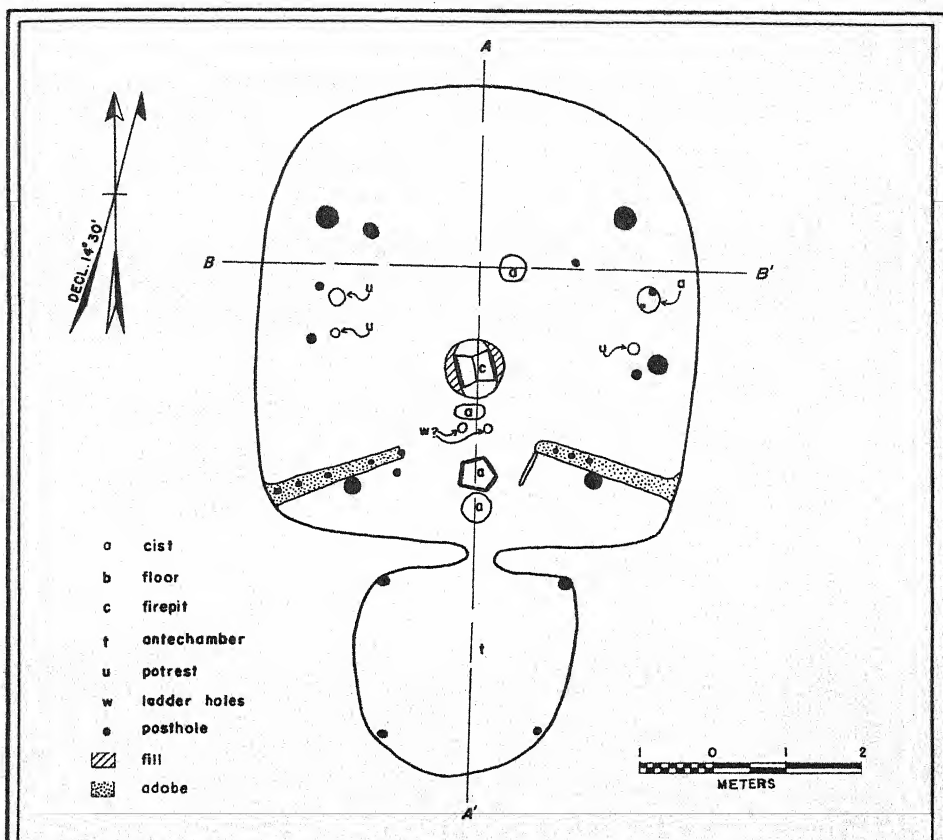




FIG. 93. Site 2, Pit House B. Showing miscellaneous holes, V-shaped firepit with cist south of it, partition walls, and southern antechamber. Arrow (50 cm. long) points magnetic north; meter stick in background.

PIT HOUSE C, SITE 2

(Fig. 94 and Map 23)

Shape.—Roundish.

Walls of unplastered, native earth.

Bench.—None.

Niches.—None.

Floor of adobe, smoothed and well defined; 82 cm. below old ground level and 1 meter below present ground level; strewn with sand in north half.

Partition Walls in south portion of house. Doorway or opening, 1.5 meters wide, south of firepit. Constructed of vertical slabs, posts, and adobe. Original height, 58 cm. (evidence from east wall, which was intact). One principal roof post incorporated in each wall.

Firepit circular; diameter, 53 cm.; filled with ashes.

Deflector.—None found. However, on floor of house at entrance to passageway, a large slab was found. When placed in vertical position, it completely closed door to passageway.

Antechamber-entryway.—Consisted of a long passage or tunnel with a bulge or swelling near middle. Floor and walls of entire complex, of native earth. Floor slopes upward from pit-house floor to within 30 cm. of old ground level. Probably roofed, but exact character of roof not known.

Sipapu(?).—North of firepit, a small hole, 7 cm. in diameter, 10 cm. in depth; filled with sand.

Cists six in number; in floor; diameters (of round ones) range from 20 cm. to 36 cm.; depths, from 8 cm. to 29 cm. South of firepit, two oval depressions; lengths, 54 cm. (nearer firepit) and 52 cm.; widths, 27 cm. and 17 cm.; and depths, 12 cm. and 8 cm., respectively. Largest cist (north of east partition wall) contained a few Lino-gray sherds and two bone awls. A post-hole had been sunk in cist lying north-east of firepit. Cist near large post-hole in northwest quadrant provided with round slab cover.

Post-holes.—Four large post-holes, one in each quadrant; diameters ranging from 18 cm. to 25 cm.; depths, from 35 cm. to 58 cm. In east half of house, four small post-holes(?), diameters ranging from 7 cm. to 10 cm.; depths, from 6 cm. to 15 cm. No wood, decayed or charred, was found in any of these holes.

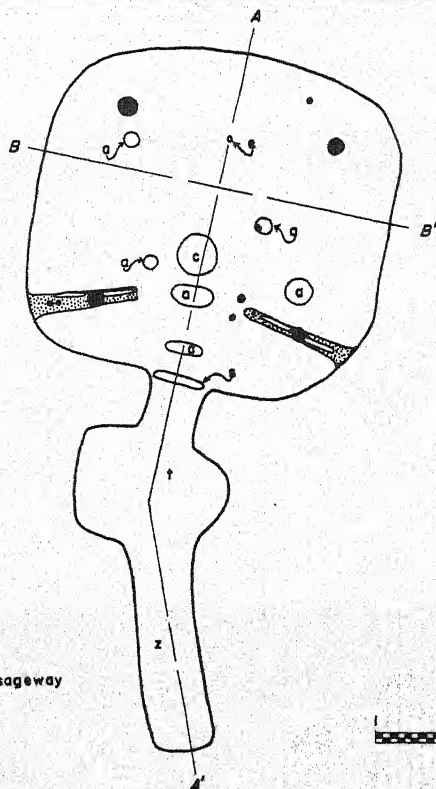
Roof.—Exact character unknown. Probably similar to type used in Pit House A, Site 2 (p. 368).

Pottery.—Predominant types: Lino gray and Abajo red-on-orange; more found than in any other pit house.

Artifacts.—See Chapter III.

Dates.—Since no wood was recovered, no dates were obtained.

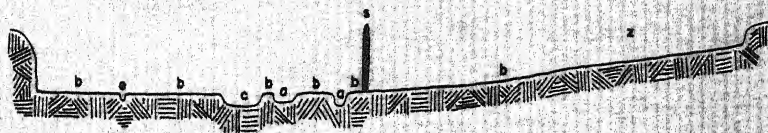
General Comments.—Pit House C did not burn.



- a cist
- b floor
- c firepit
- e sipapu
- s slab
- t antechamber
- z depressed passageway
- o posthole
- adobe



SECTION AA'



SECTION BB'



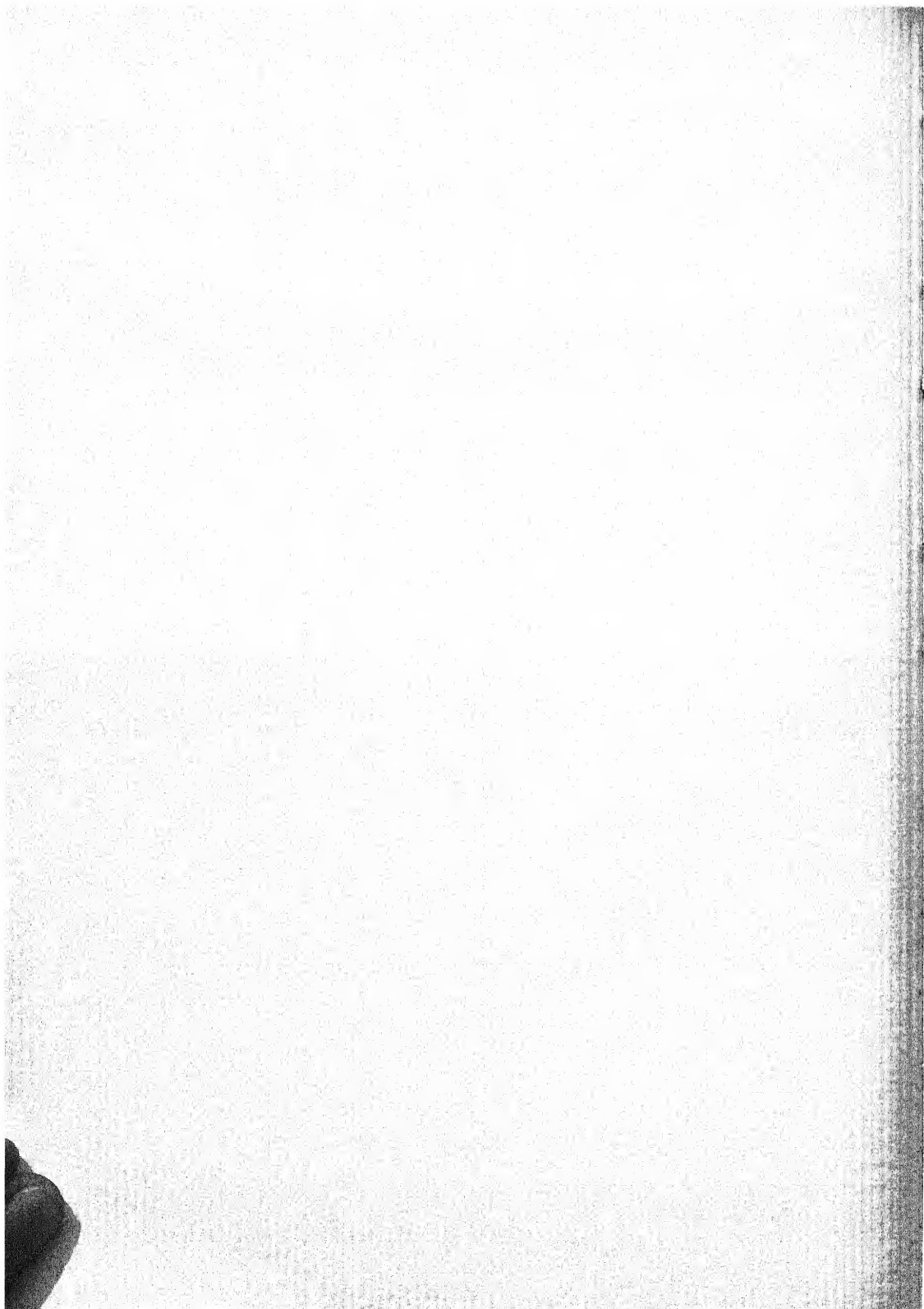




FIG. 94. Site 2, Pit House C. Showing four large post-holes, miscellaneous holes, firepit with depressions to south, partition walls, southern antechamber, and long passageway. Arrow (50 cm. long) points magnetic north; meter stick in background.

PIT HOUSE D, SITE 2

(Figs. 95-97 and Map 24)

Shape.—Square.

Walls of unplastered, native earth.

Bench.—None.

Niches two; in walls; one in southwest corner and one in southeast corner; round; slope slightly downward. Diameter and depth of southwest niche, 32 cm. and 62 cm., respectively; height above floor, 62 cm. Diameter and depth of southeast niche, 24 cm. and 57 cm., respectively; height above floor, 47 cm.

Floor of smoothed, hard-packed adobe (mutilated by rodents); 1.55 cm. below old ground level.

Partition Walls in south portion of house; formed of slabs and adobe. Slabs set in grooves cut in floor. Very short, each partition extending from outer wall only 72 cm. Height of east partition, 74 cm.; of west partition, 54 cm. At end of each partition wall (i.e. nearer firepit), a post-hole for one of principal roof posts. Extending from each post-hole in curved lines towards firepit were two ridges of adobe, 4 cm. high and 10 cm. wide.

Firepit.—Circular depression in floor; no rim; diameter, 62 cm.; depth, 32 cm.; filled with ashes.

Deflector.—Sandstone slab, set in groove cut in floor; projected above floor 28 cm.; overall height of slab, 45 cm.; width, 39 cm.; thickness, 5 cm.

Antechamber-entryway.—Passageway cut through native earth; floor, 14 cm. above pit-house floor; small step, 7 cm. high, in front of entrance, thus making ingress and egress easier(?). Width of passageway, 37 cm.; height, 72 cm.; length, 71 cm. Antechamber approximately 1.45 meters square; walls of native earth. Probably roofed, but exactly how is not known.

Sipapu(?).—North of firepit, a sand-filled hole; diameter, 23 cm.; depth, 26 cm.

Cist in northeast quadrant; diameter, 40 cm.; depth, 26 cm.; filled with sand.

Pot-rests fifteen in number; in floor; diameters range from 15 cm. to 35 cm.; depths, from 4 cm. to 11 cm.; all filled with sand. Lino-gray pot resting in one of these holes.

Post-holes.—Four principal post-holes, one in each quadrant; diameters, 17 cm. to 18 cm.; depths, 44 cm. to 48 cm. In addition, two other very small holes near post-hole in northwest quadrant. No wood obtained from these holes.

Roof.—Exact character unknown, but probably similar in type to that in Pit House A, Site 2 (p. 368).

Pottery.—Predominant types: Lino gray and Abajo red-on-orange (see Chapter IV).

Artifacts.—See Chapter III.

Dates.—None obtained, since wood specimens were lacking.

General Comments.—Digging-stick marks(?) were observed on wall in southwest quadrant.

Since this house contained refuse, the method of excavation was slightly different. Northern half was first completely cleared. Soil profile was then cut on face of fill remaining in southern half. From this profile, it was observed that fill consisted mostly of ash, sherds, and rocks. Near the pit-house walls was some washed-in soil. The refuse had been so churned by rodents, that the stratigraphic evidence, if any ever existed, must have been destroyed.



FIG. 95. Site 2, Pit House D. Showing four large post-holes, miscellaneous holes, firepit, partition walls, southern antechamber, niches in southeast and southwest corners. Arrow (50 cm. long) points magnetic north; meter stick in background.

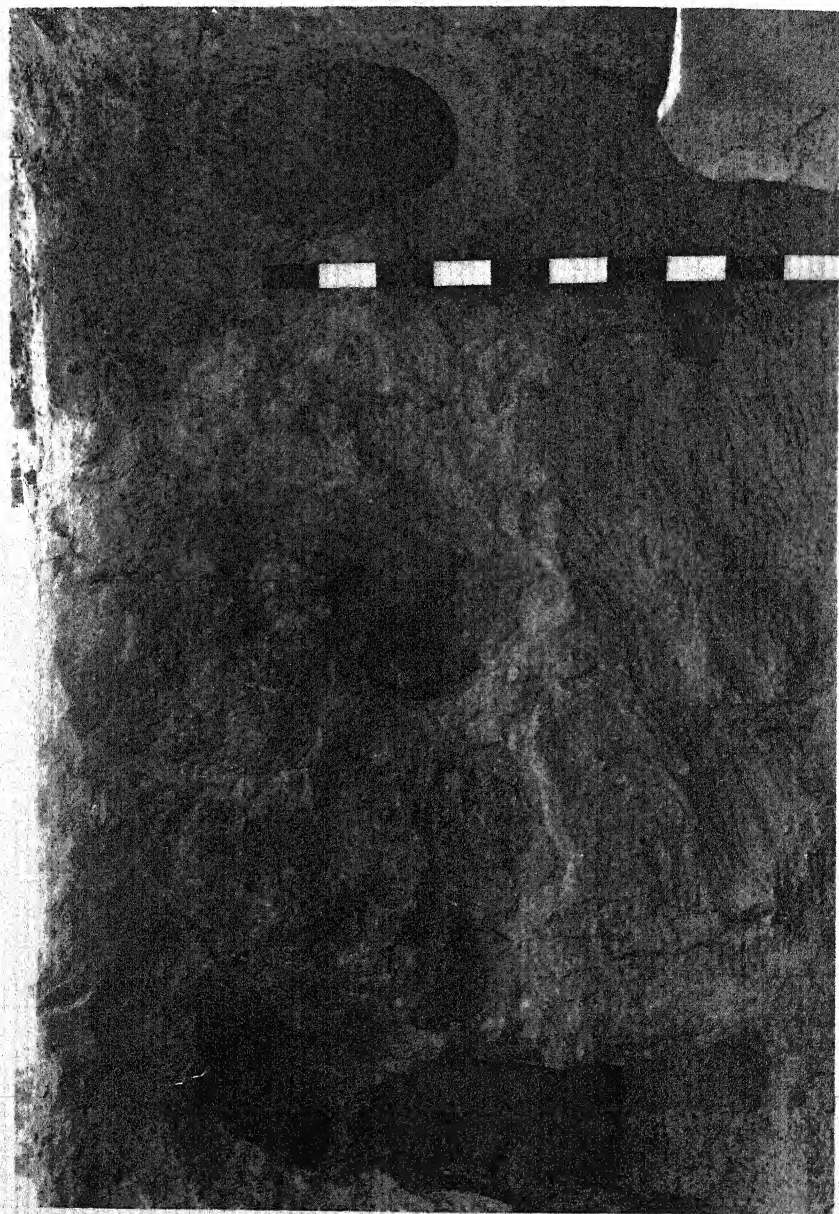
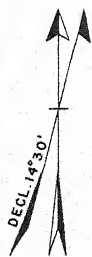
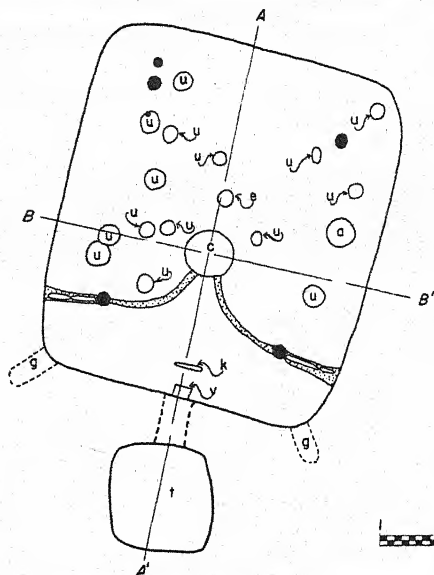


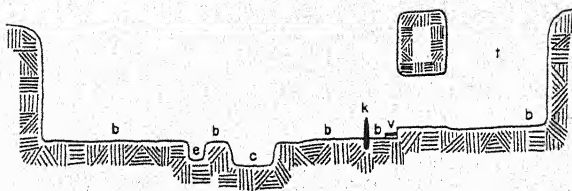
FIG. 96. Site 2, Pit House D. Showing (at left) portion of ventilator tunnel, digging-stick marks in center, and niche at right. Meter stick at right.



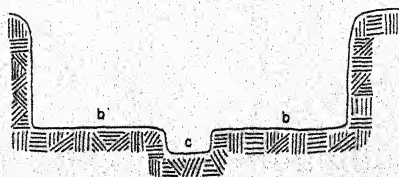
- a cist
- b floor
- c firepit
- e sipapu
- g niche
- k deflector
- t antechamber
- u potrest
- v step
- posthole
- ▨ adobe



SECTION AA'



SECTION BB'



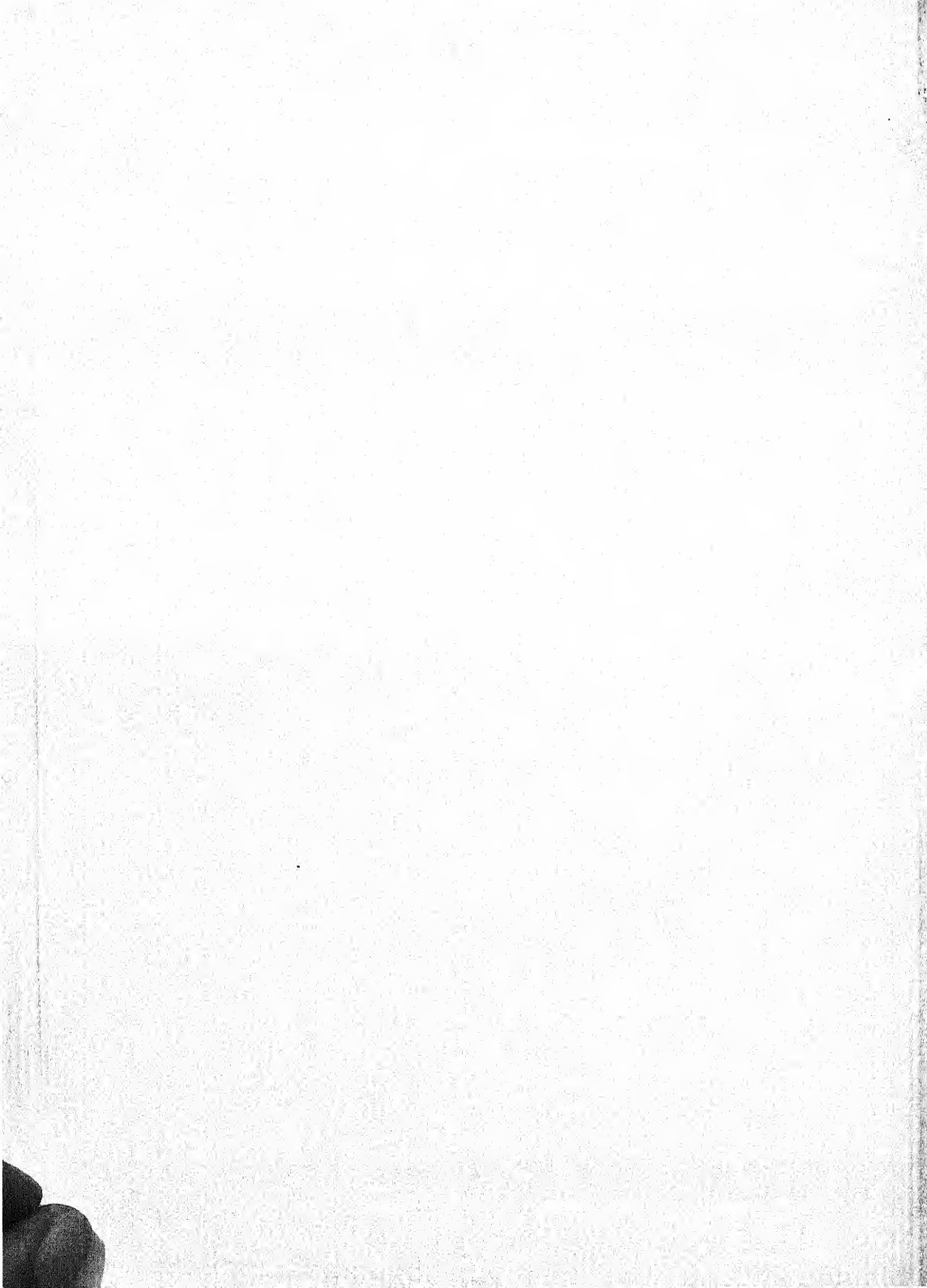




Fig. 97. Site 2, Pit House D; looking south at soil profile of fill. Dark portion, soft, ashy refuse; light portions, red fill-dirt. Three-meter stick on top of fill.

CIRCULAR, SUBTERRANEAN PIT F,¹ SITE 2

(Fig. 98 and Map 26)

Shape.—Circular.

Walls of unplastered, native soil.

Floor of smoothed adobe, 1 meter below old ground level.

Post-holes eight in number, all about 7 cm. in diameter, and 6 cm. to 9 cm. in depth. No wood found in any of them.

Slab set upright in floor, in southeast quadrant. Slab measured 58 cm. in height, 45 cm. in width, and 10 cm. in thickness; projected above floor 25 cm.

Bench(?).—Two upright stone slabs, each with notched upper ends, set in floor in north zone; slabs 1.35 meters apart and projected above floor 29 cm. A log could have been placed in notches, thereby providing a seat or rack.

Mortar(?) inset in floor 3 cm.; consisted of slab 56 cm. long, 32 cm. wide, with pecked, circular depression, 2 cm. deep. In mortar was found a handful of tiny pebbles.

Roof.—Probably covered, but how is not known.

Uses.—Not known. Possible uses: place for special grinding purposes, a storehouse, or a sweat bath.

Dates.—None obtained.

¹ Called Pit House F before its true nature was ascertained.

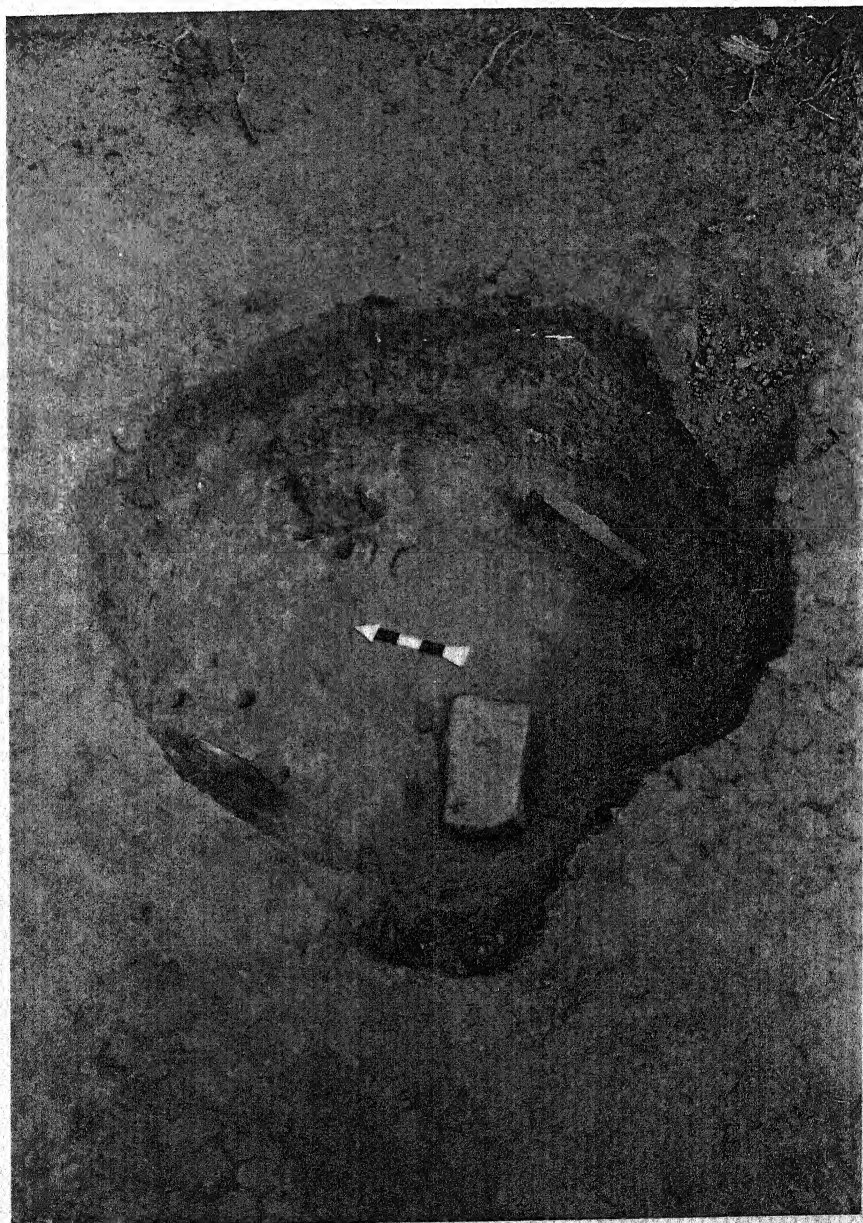


FIG. 98. Site 2, subterranean pit ("Pit House" F). Showing two upright notched slabs (at left), mortar, and slab. Arrow (50 cm. long) points magnetic north.

PIT HOUSE G, SITE 2

(Figs. 99-101 and Map 25)

Shape.—Square.

Walls.—Face of bench lined with slabs; walls above bench, native soil.

Bench on east, north, and west sides only. Face of bench, of slabs; seat, of well-packed earth. Greatest height, 63 cm.; least height, 48 cm. Greatest depth, 55 cm.; least depth, 26 cm. No niches.

Floor of smoothed, hard-packed adobe; 1.55 meters below old ground surface.

Partition Walls in south portion of house; width of opening, 1.75 meters. Walls composed of slabs and adobe; slabs set in grooves, 5 cm. deep. Original height (east end intact), 76 cm. Thickness of west wall varied from 2 cm. to 10 cm.; of east wall, 10 cm. to 25 cm. One principal roof post incorporated in each wall. Post-holes, seven in number, forming semi-circle, and placed between inner ends of partition walls; diameter of holes, 8 cm. to 13 cm., and depths from 4 cm. to 13 cm. Charred wood in two holes. These may have formed a deflector(?) at one time.

Firepit or Oven(?).—Peculiar type; not centered, but lies in northwest quadrant. Consists of circular rim of adobe (rim is older than superior portions) on which an adobe upper portion had been constructed. Pronounced batter to walls. Height of walls, 52 cm.; thickness, 8 cm. to 12 cm. Diameter of oven at top, 1 meter; at bottom, 1.23 meters. Much ash at bottom of oven at floor level. *Firepit*(?) original(?), in normal position; pointed bottom; diameter at top, 80 cm.; depth, 25 cm. Contained some ashes, but did not show evidence of many fires.

Deflector.—None found. Just north of opening to passageway and in normal position for a deflector, a groove in floor was found.

Antechamber-entryway.—Passageway walls and floor of native earth; height of passage, 55 cm.; width, 80 cm.; length, 1.2 meters; floor slopes upward. Antechamber walls and floor of native earth; rectangular; 2.18 meters by 1.5 meters. Floor 20 cm. above pit-house floor. Probably roofed, but no post-holes found.

Sipapu.—Uncertain. North of little-used, pointed-bottom firepit; a hole, 25 cm. in diameter and 15 cm. in depth.

Cists four in number; oval and round.

Pot-rests seven in number; diameters from 15 cm. to 20 cm.; depths from 5 cm. to 9 cm. All filled with sand.

Post-holes sixty-eight in number. Four large, principal ones in floor, each containing charred wood; one in each quadrant, diameters ranging from 24 cm. to 30 cm., depths from 55 cm. to 70 cm. Seven holes distributed between ends of partition walls (see under *Partition Walls*, for description). Fifteen lesser post-holes, scattered irregularly, in floor, diameters ranging from 3 cm. to 12 cm. and depths from 5 cm. to 18 cm. Forty-two in bench, diameters ranging from 7 cm. to 12 cm., and depths, from 3 cm. to 38 cm.; all of these bench post-holes contained charred stubs which were set in bench at an angle.

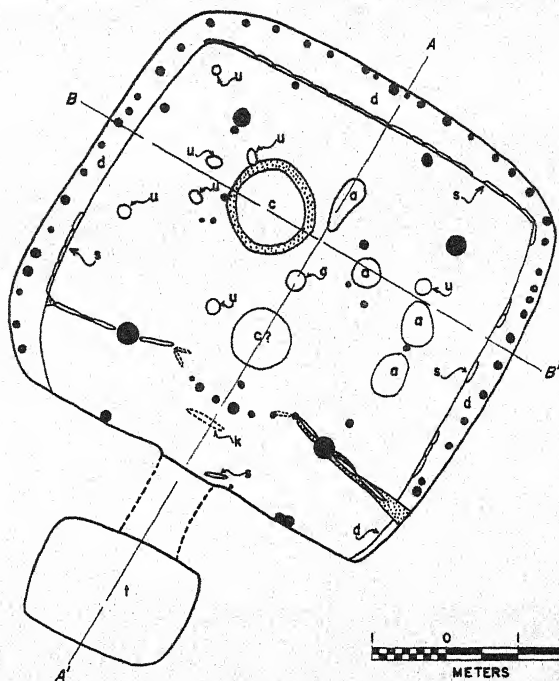
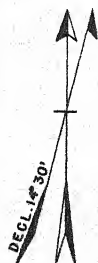
Roof.—Probably supported by four large posts, upper ends of which may have been forked, thus providing a rest for framework of four main stringers. On this framework rested the upper ends of poles, the lower ends of which were set at an angle in the bench. The triangular space thus created between the outer walls of the pit house and the slanting roof poles, was probably filled with earth.

Pottery.—Predominant types: Lino gray and Abajo red-on-orange.

Artifacts.—See Chapter III.

Dates.—A.D. 768 ± x.

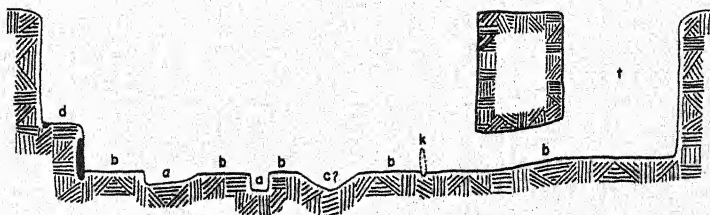
General Comments.—Pit House G burned.



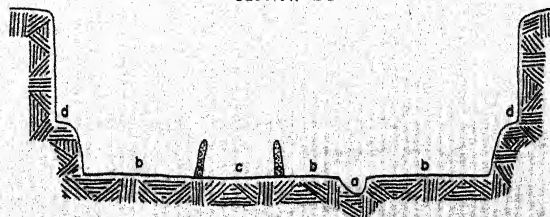
- a cist
- b floor
- c firepit
- d bench
- k deflector
- s slab
- t antechamber
- u potrest
- e posthole
- adobe



SECTION A A'



SECTION B B'



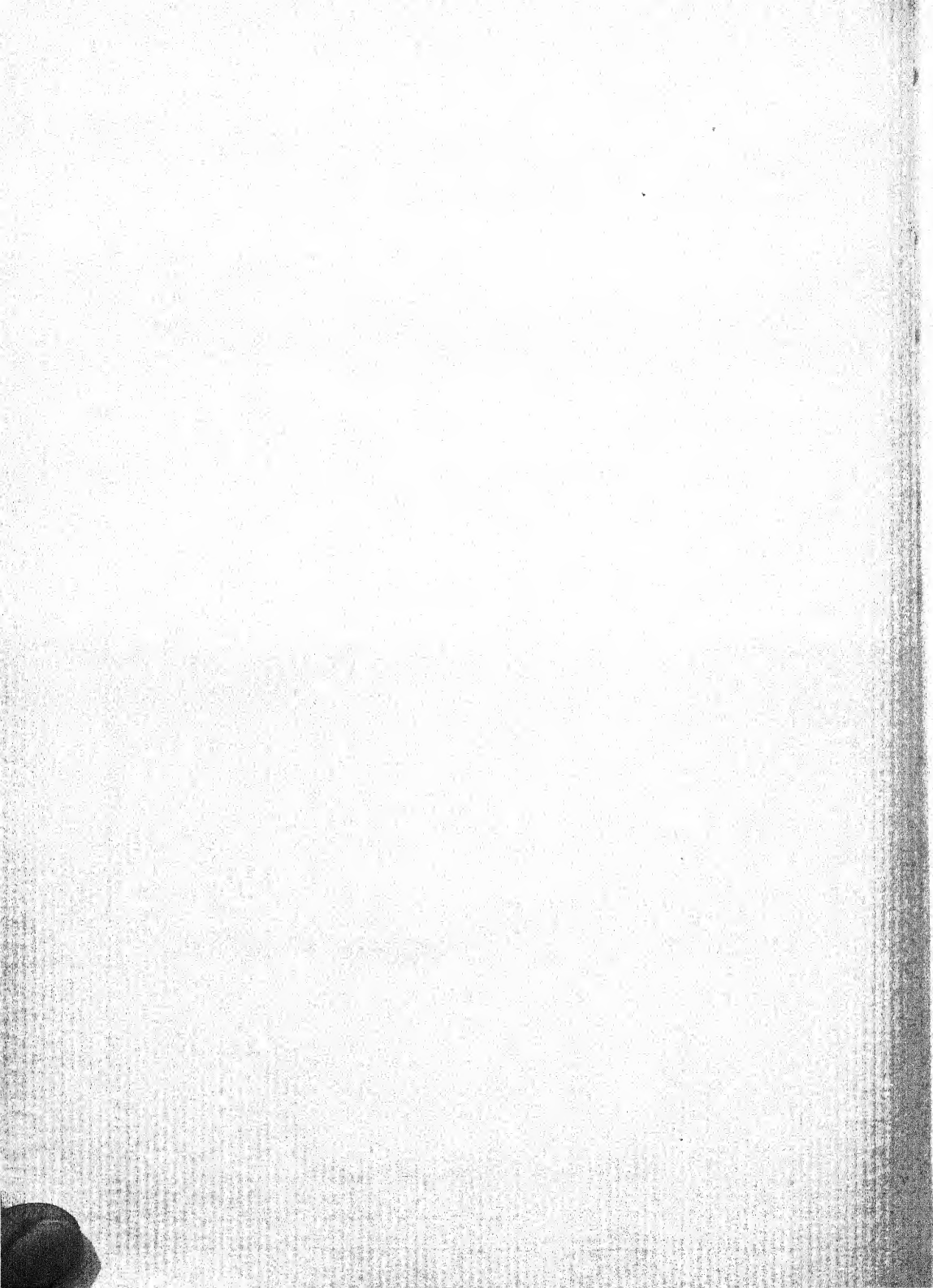




FIG. 99. Site 2, Pit House G; looking south. Showing bench with post-holes, three large post-holes in floor, miscellaneous holes and cists, peculiar firepit (or oven) with high walls, partition walls, and southern antechamber. Arrow (50 cm. long) points magnetic north; meter stick in background.

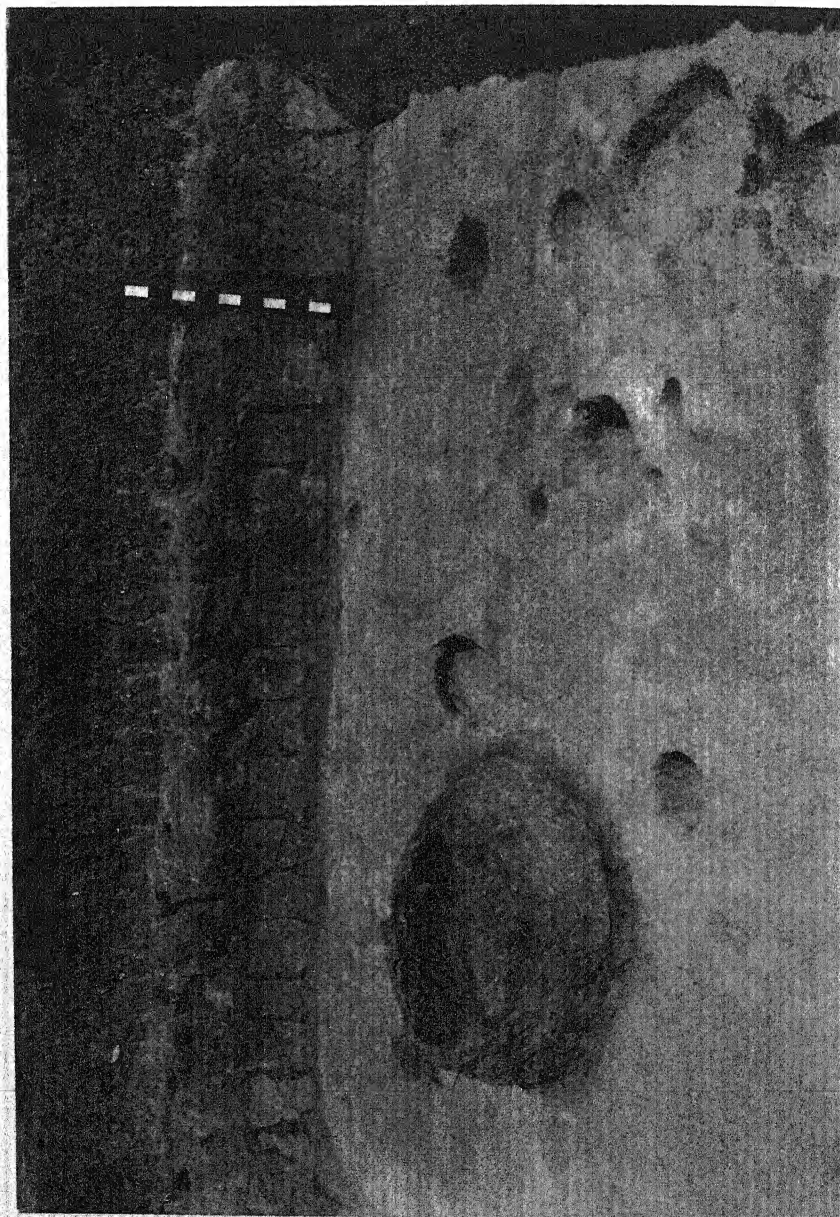


FIG. 100. Site 2, Pit House G; looking north. Showing slabs set in face of bench and peculiar firepit at left. Meter stick in background.

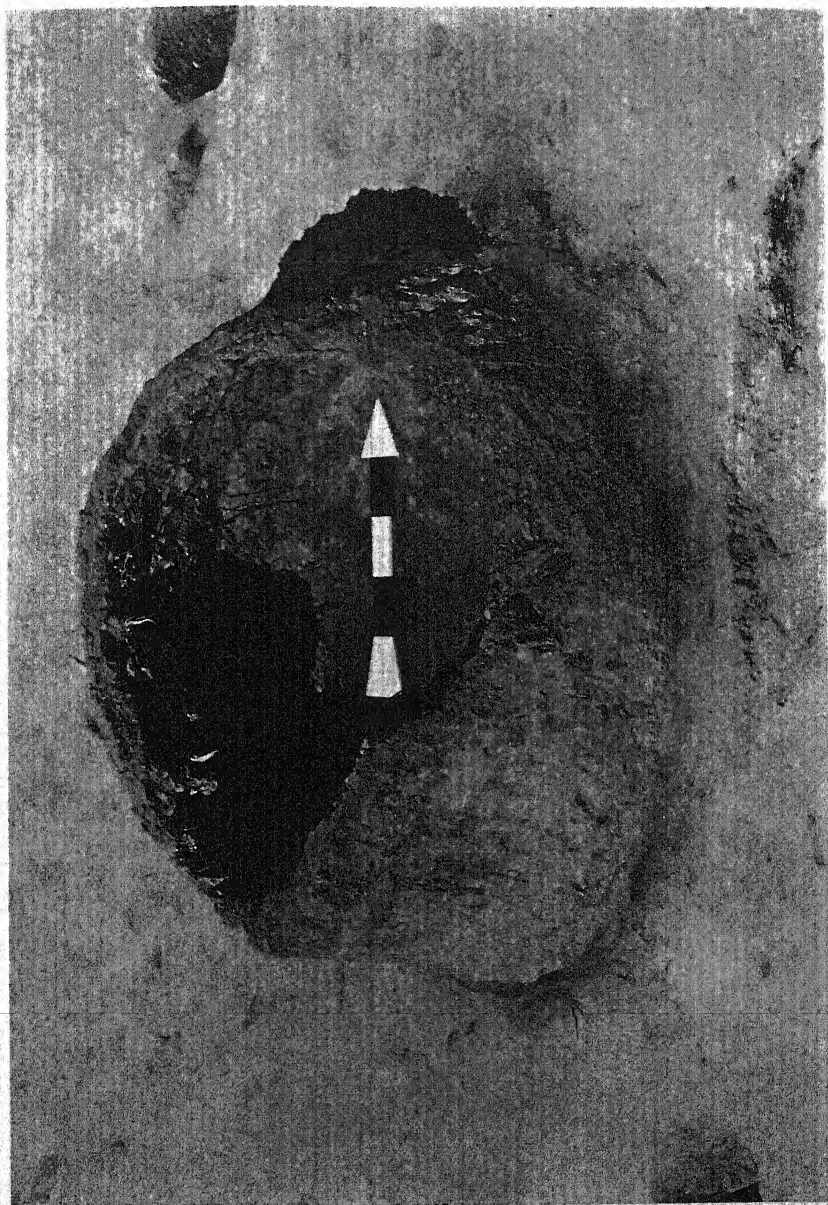


FIG. 101. Site 2, Pit House G. Detail of peculiar large firepit. Arrow (50 cm. long) points magnetic north.

PIT HOUSE H, SITE 2

(Fig. 102 and Map 26)

Shape.—Square.

Walls of unplastered, native earth.

Bench.—None.

Niches.—None.

Floor of hard-packed adobe; 1.25 meters below old ground level and 1.45 meters below present ground level.

Partition Walls in south portion of house; of vertical slabs and adobe plaster. East wall, 65 cm. long and 25 cm. high. West wall, none standing; but in proper place, a groove, 52 cm. long, 7 cm. wide, 10 cm. deep; on floor, with bottom near groove, a sandstone slab which fitted into groove perfectly.

Firepit, originally circular, 62 cm. in diameter. Contained ash; cut in half by huge pit sunk in floor.

Deflector.—Sandstone slab set in groove in floor; slab was 45 cm. wide, 4 cm. thick, and projected above floor 26 cm. Overall height of slab, 37 cm.

Antechamber-entryway.—Passageway walls and floor of native earth; height of passage, 55 cm.; width, 62 cm. to 88 cm.; length, 1.2 meters. Floor at same level as pit-house floor. Antechamber walls and floor of native earth; about square (1.4 meters); floor at same level as pit house; method of roofing unknown.

Sipapu.—None found.

Cists, or *Pot-rests*, eight in number, in floor. Diameters ranged from 9 cm. to 63 cm.; depths, from 5 cm. to 17 cm. All filled with fine sand.

Large Pit.—Sunk in floor of pit house, cutting firepit and two cist-like depressions. Pit measured 1.9 meters long, 1.85 meters wide, 46 cm. deep. Walls of pit, of native earth; floor of adobe plastered on gypsum outcrop. No post-holes found therein. Pit evidently dug after pit house, because pit-house floor stopped at edges of pit. It is likely that pit was dug and used after pit house was abandoned. Use unknown.

Post-holes four in number, one in each quadrant. Diameters ranged from 20 cm. to 24 cm.; depths, from 30 cm. to 50 cm. No wood was obtained.

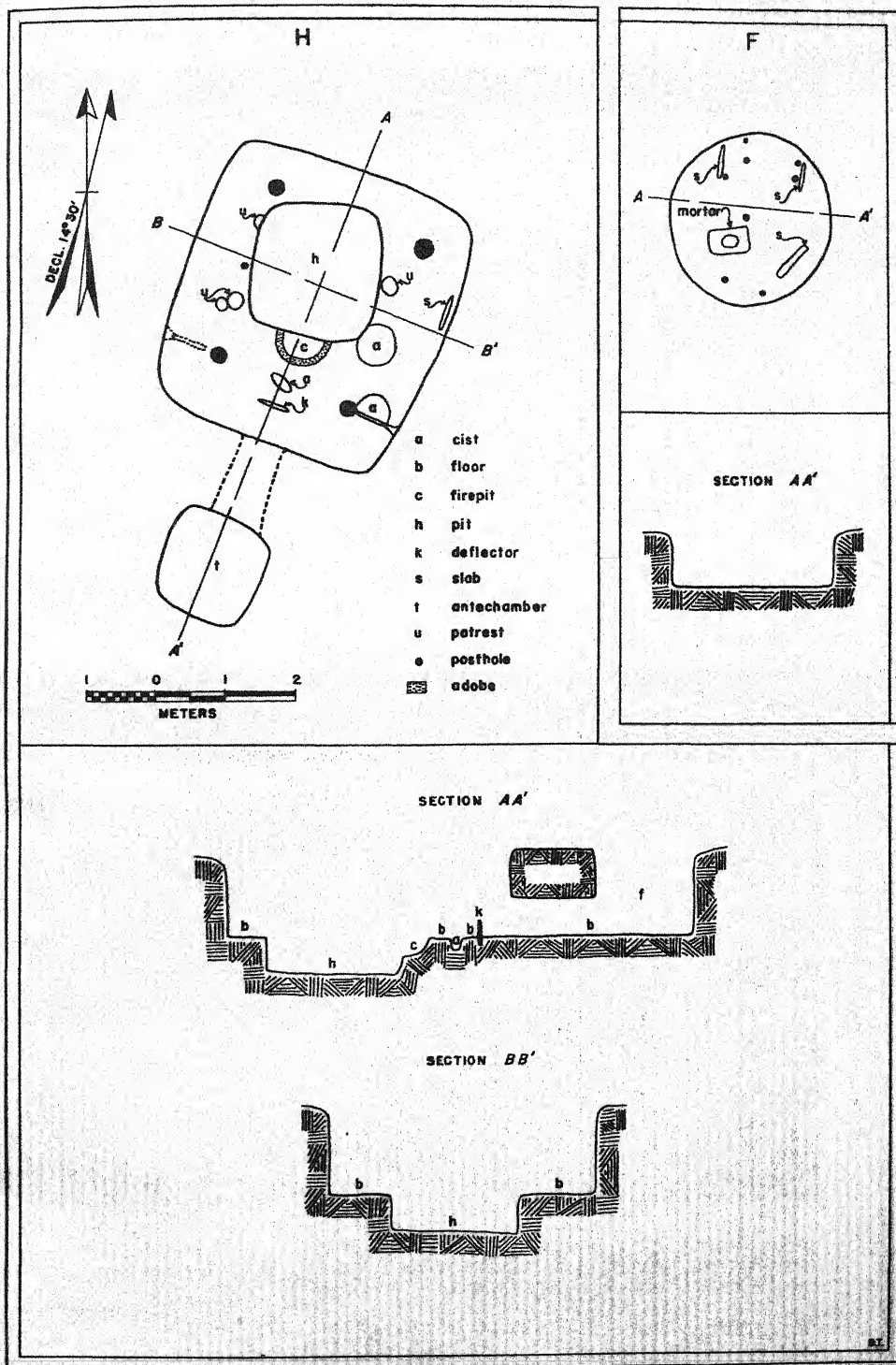
Roof.—Exact character unknown. Probably similar to that described for Pit House A, Site 2 (p. 368).

Pottery.—Predominant types: Lino gray and Abajo red-on-orange.

Artifacts.—See Chapter III.

Dates.—None obtained.

General Comments.—Pit House H did not burn. The large pit, which destroyed the pit-house floor, was a unique feature.



MAP 26. GROUND PLAN AND SECTIONS OF PIT HOUSE H

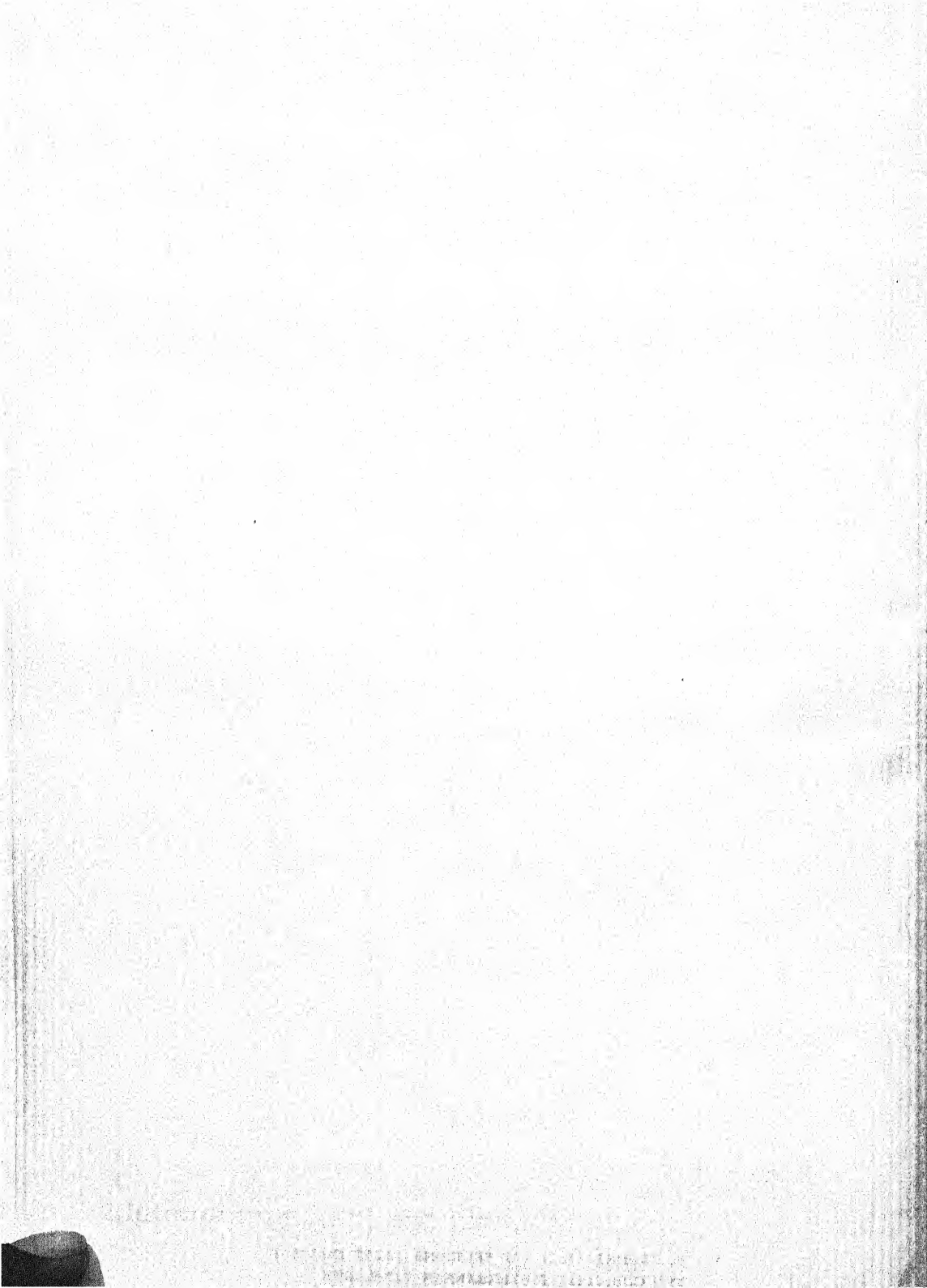




FIG. 102. Site 2, Pit House H. Four large post-holes, large secondary pit which cut away half of firepit, portion of east partition wall, deflector, and southern antechamber. Arrow (50 cm. long) points magnetic north; meter stick in background.

III. ARTIFACTS¹

BY

JOHN RINALDO

The identification of materials in the stone objects was made by Mr. Sharat K. Roy, Curator of Geology at Field Museum. The identification of the unworked bone and the bone implements was made by Mr. D. Dwight Davis of the Department of Zoology at Field Museum.

On pages 388-430 the details of the artifacts are given in outline form. For convenience the artifacts have been grouped under the following headings:

Object	Total from both sites
Problematical stones.....*	16
Manos.....	204
Rubbing stones.....	28
Grinding stones.....	22
Metates.....	45
Mortars.....	2
Floor polishers.....	25
Pot polishers.....	12
Lightning stones.....	6
Hammer stones.....	179
Notched axes.....	13
Grooved axes.....	3
Grooved club heads.....	2
Grooved mauls.....	6
Notched axes (chipped).....	4
Notched hoes.....	2
Notched maul.....	1
Loom weights.....	3
Projectile points and knives.....	37
Drills, graters, scrapers and choppers.....	12
Pendants.....	10
Bracelet.....	1
Gambling pieces.....	4
Bone disk.....	1
Beads.....	12
Worked sherds.....	21
Figurine.....	1
Pipes.....	4
Bone whistles.....	7
Fleshers.....	7
Needles.....	4
Awls.....	63
Total artifacts from both sites.....	757

More milling stones, such as manos, metates, rubbing stones, and the associated hammer stones used for pitting the surfaces of

¹ On the basis of the typology of pottery and architecture, Site 2 is assumed to be older than Site 1. (This assumption was verified by tree-ring dates.)

these objects, were found on Site 1 than on Site 2. This may indicate that the Indians who inhabited Site 1 used more corn or other grain as food than did those who inhabited Site 2 (the earlier site).

More unworked animal bones and bone tools were found on Site 2 than on Site 1. This may indicate that the Indians who inhabited Site 2 hunted more than those who inhabited Site 1, or merely that the inhabitants of Site 2 were better hunters. Although more side scrapers were found on Site 2 the proportion of other chipped stone implements, such as projectile points and knives, which might have been used in hunting, is approximately equal.

Pipes were found only at Site 1. Single specimens were secured of a large number of other types of artifacts on one site or the other. None of these single specimens, however, is considered particularly significant, with the exception of a shell bracelet made from a *Glycymeris* shell (from Gulf of California) which could have been secured only by trade.

The inhabitants of both sites seem to have had a preference for manos and rubbing stones with parallel surfaces, as more of these were found than of any other type.

It is probable that a few of the sandstone disks recorded as pot covers were used as covers over holes in the floors of pit houses, inasmuch as a number of similar disks were found *in situ*. On the other hand most of these disks are much smaller than the average hole cover found *in situ*, and therefore probably served some other function.

OBJECTS OF GROUND AND PECKED STONE: PROBLEMATICAL

POT COVERS(?)

(Fig. 103)

- Roundish disks of sandstone with flat upper and lower surfaces and slightly battered edges. 8
 From Site 1. 1
 From Site 2. 7
 Diameter: maximum, 17.5 cm.; minimum, 5.2 cm.
 Material: sandstone

ARROW SHAFT SMOOTHER(?)

(Fig. 103)

- Small oblong stone with six sides having grooved surfaces. 1
 From Site 2. 1
 Length, 7 cm.; width, 2.5 cm.; thickness, 2 cm.
 Material: sandstone

STONE BALLS

(Fig. 103)

- Unsymmetrical stone balls, probably a natural formation. 2
 From Site 1. 2
 Diameters: 5.5 cm. and 5.6 cm.
 Material: sandstone

CUBE

(Fig. 103)

- Stone cube, roughly square. 1
 From Site 1. 1
 Almost 2.3 cm. square
 Material: sandstone

PAINT CUP(?)

(Fig. 103)

- Cup-shaped concretion, the hollow of which has been deepened by pecking. 1
 From Site 2. 1
 Diameter, 4 cm.; thickness, 0.5 cm.
 Material: sandstone

CARVED PEBBLE

(Fig. 103)

- Shoe-shaped stone with diagonal notches carved on bottom surface at pointed end. 1
 From Site 1. 1
 Length, 2.5 cm.
 Material: limestone

FINGER STONE

(Fig. 103)

- Finger-shaped stone with polished surfaces. 1
 From Site 2. 1
 Length, 9.3 cm.; width, 2.5 cm.; thickness, 2 cm.
 Material: granite

TABLET

(Fig. 103)

- Very small stone tablet. 1
 From Site 2. 1
 Length, 1.7 cm.; width, 1.2 cm.; thickness, 0.3 cm.
 Material: sandstone

PROJECTILE POINT

(Fig. 103)

- Polished stone in shape of straight-stemmed arrowhead notched above tangs. 1
 From Site 1. 1
 Length, 5.3 cm.
 Material: limestone

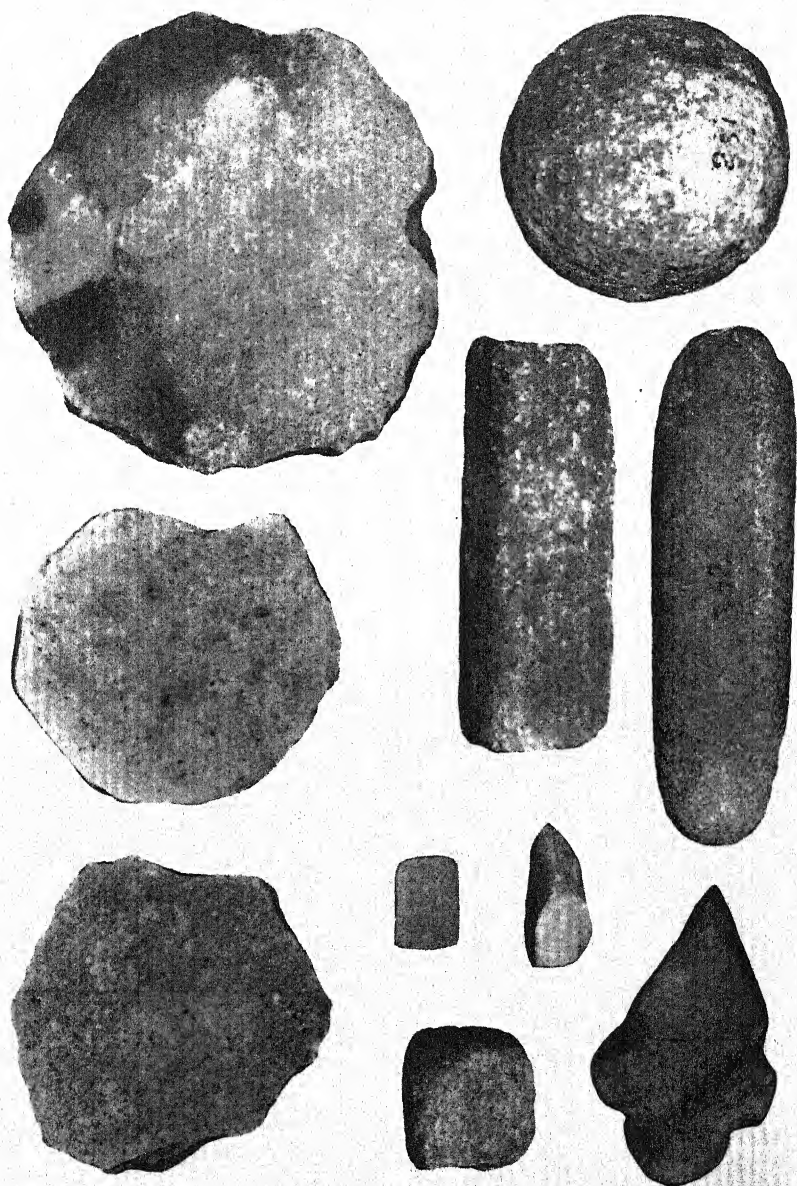


FIG. 103. Problematical objects. Left side, pot covers. Right side, top row, stone ball; second row, finger stone (right), and arrow shaft smoother (left); third row, carved pebble (right), and tablet (left); fourth row, projectile point (right), and stone cube (left). Natural size.

OBJECTS OF GROUND AND PECKED STONE—*Continued*

MANOS

(Figs. 104-106)

Manos with single grinding surfaces:

(a) Flat grinding surface, both surfaces parallel.....	39
From Site 1.....	23
From Site 2.....	11
(b) Flat grinding surface, wedge-shaped.....	6
From Site 1.....	5
From Site 2.....	1
(c) Flat grinding surface, upper surface concave.....	1
From Site 1.....	1
(d) Convex grinding surface, upper surface concave.....	1
From Site 2.....	1
(e) Convex grinding surface, both surfaces parallel.....	41
From Site 1.....	36
From Site 2.....	5
(f) Convex grinding surface, wedge-shaped.....	19
From Site 1.....	15
From Site 2.....	4

Total from both sites.....107

Manos with two grinding surfaces:

(a) Flat grinding surfaces, both surfaces parallel.....	23
From Site 1.....	18
From Site 2.....	5
(b) Flat grinding surfaces, wedge-shaped.....	5
From Site 1.....	3
From Site 2.....	2
(c) Concave grinding surfaces, both surfaces parallel.....	2
From Site 2.....	2
(d) Convex grinding surfaces, both surfaces parallel.....	21
From Site 1.....	14
From Site 2.....	7
(e) Convex grinding surfaces, wedge-shaped.....	8
From Site 1.....	4
From Site 2.....	4
(f) One convex grinding surface, one flat grinding surface, both surfaces parallel.....	26
From Site 1.....	17
From Site 2.....	9
(g) One convex grinding surface, one flat grinding surface, wedge-shaped in cross section.....	11
From Site 1.....	8
From Site 2.....	3
(h) One convex grinding surface, one concave grinding surface, wedge-shaped in cross section.....	1
From Site 2.....	1

Total from both sites..... 97

Total of all types of manos from both sites.....204

Length: maximum, 26.1 cm.; minimum, 16.1 cm. Width: maximum, 14.2 cm.; minimum, 8.3 cm. Thickness: maximum, 8.7 cm.; minimum, 1.5 cm.

Most manos about 20 cm. long, 10 cm. wide, and 4 cm. thick

Material: sandstone; some conglomerate and quartzite

Manos with one edge curved inward, 20

Manos with pit in one edge, 2

Manos with pits in both edges, 1

Manos with both edges curved inward, 2

Wedge-shaped manos are merely worn out or old parallel-sided manos (Fig. 106). Both Kidder (1930, p. 70) and Bartlett (1930, p. 15) illustrate this process of abrasion with drawings.



FIG. 104. Manos mostly wedge-shaped in cross section. Scale 1:6.

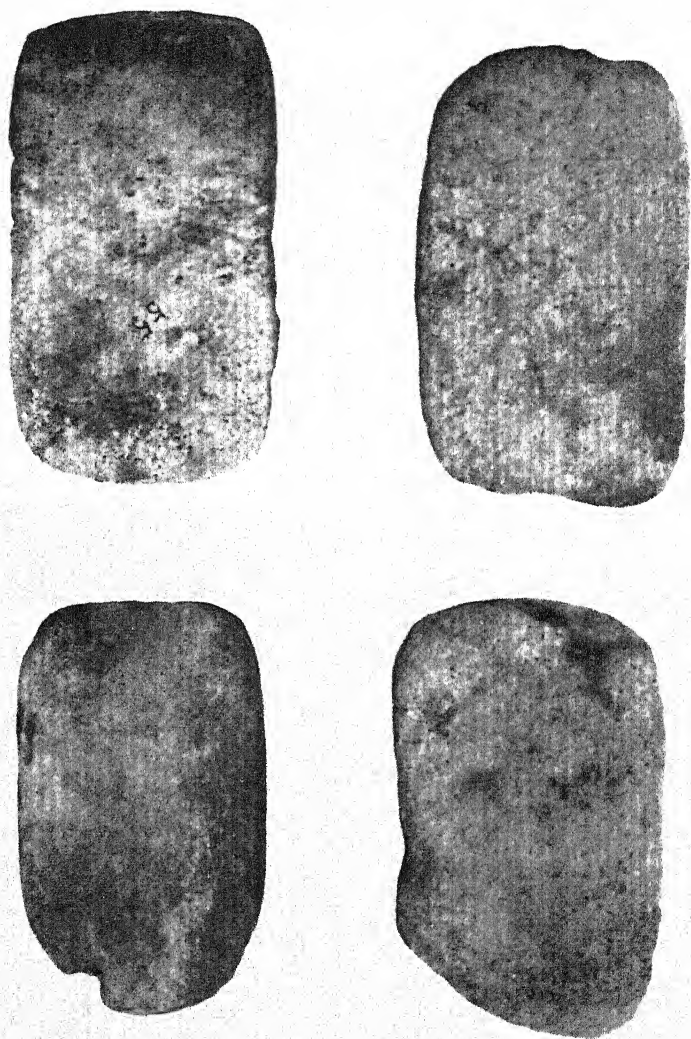


FIG. 105. Manos. Scale 1:3.

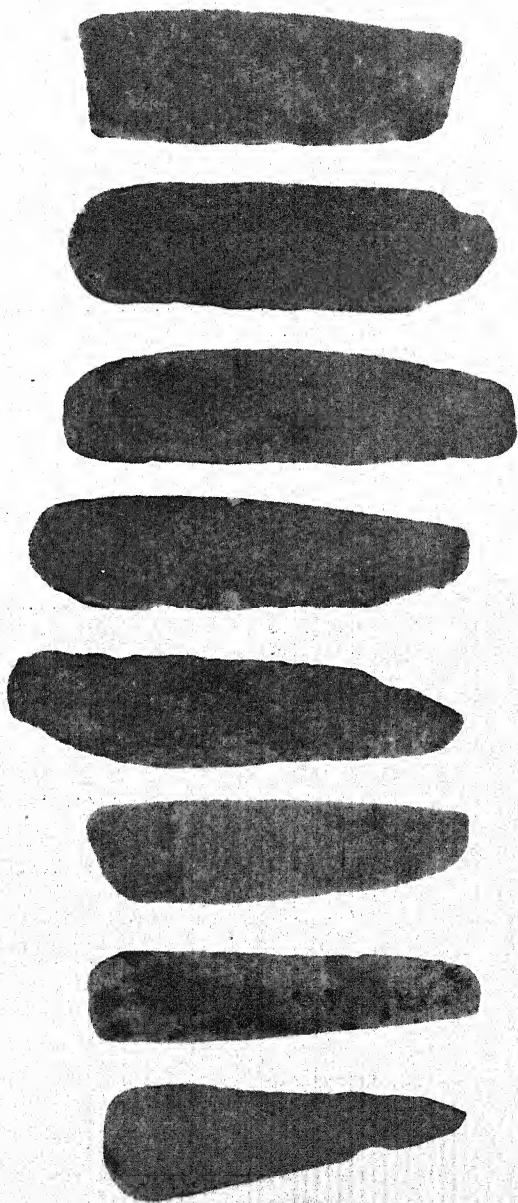


FIG. 106. Manos. Cross section of manos showing range from tabular form with parallel grinding surfaces to those wedge-shaped in cross section.

OBJECTS OF GROUND AND PECKED STONE—*Continued*

RUBBING STONES

(Fig. 107)

Rubbing stones with single grinding surface:

- | | |
|---|---|
| (a) Round shape in outline; one flat surface, and one convex surface, both surfaces parallel..... | 2 |
| From Site 1..... | 1 |
| From Site 2..... | 1 |

Rubbing stones with two grinding surfaces:

- | | |
|--|----|
| (a) Round or oval shape in outline; flat surfaces, both surfaces parallel | 10 |
| From Site 1..... | 6 |
| From Site 2..... | 4 |
| (b) Oblong shape in outline, flat grinding surfaces, both surfaces parallel..... | 4 |
| From Site 1..... | 2 |
| From Site 2..... | 2 |
| (c) Oblong shape in outline, convex grinding surfaces, both surfaces parallel..... | 5 |
| From Site 1..... | 3 |
| From Site 2..... | 2 |
| (d) Oblong shape in outline; convex grinding surfaces, wedge-shaped in cross section..... | 2 |
| From Site 1..... | 1 |
| From Site 2..... | 1 |
| (e) Round shape in outline; one convex grinding surface, one flat grinding surface, both surfaces parallel..... | 1 |
| From Site 2..... | 1 |
| (f) Oblong shape in outline; one convex grinding surface, one flat grinding surface, both surfaces parallel..... | 4 |
| From Site 1..... | 1 |
| From Site 2..... | 3 |

Total from both sites..... 28

Length: maximum, 15.2 cm.; minimum, 8.3 cm. Width: maximum, 10.7 cm.; minimum, 6.5 cm. Thickness: maximum, 5.8 cm.; minimum, 3 cm.

Material: sandstone

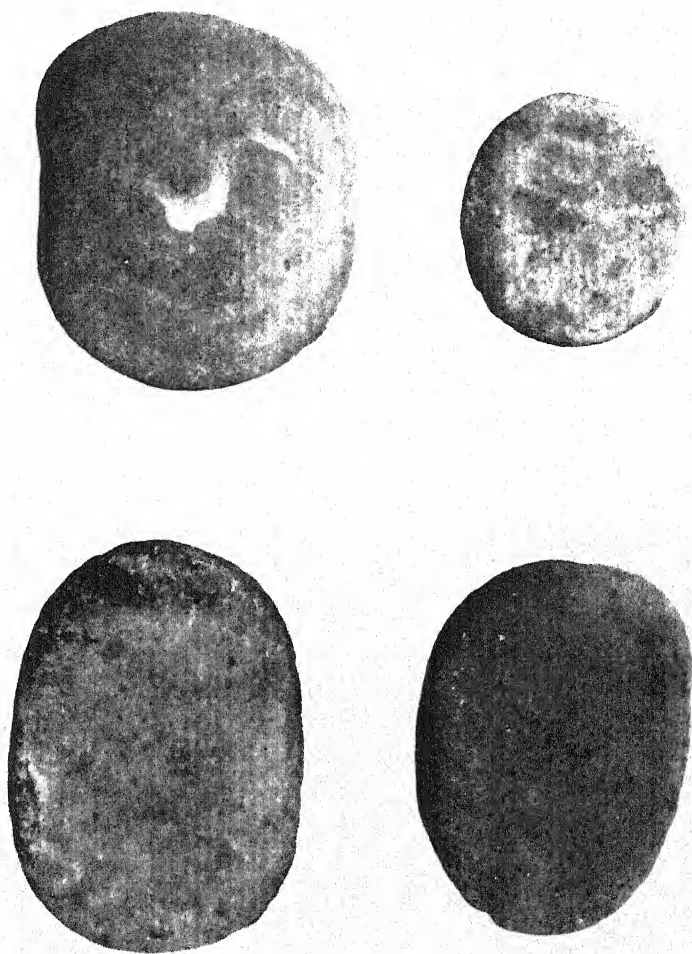


FIG. 107. Rubbing stones. Scale 1:3.

OBJECTS OF GROUND AND PECKED STONE—*Continued*

GRINDING STONES

(Fig. 108)

Grinding stones with single grinding surface:

- (a) Oval shape in outline, flat grinding surface, other surface convex,
both surfaces parallel. 16
- From Site 1. 9
- From Site 2. 7

Grinding stones with two grinding surfaces:

- (a) Oval shape in outline, flat grinding surfaces, both surfaces parallel 2
- From Site 1. 1
- From Site 2. 1
- (b) Irregular shape in outline, one flat grinding surface, and one
convex grinding surface, both surfaces parallel. 4
- From Site 1. 3
- From Site 2. 1

Total from both sites. 22

Length: maximum, 22.9 cm.; minimum, 9 cm. Width: maximum, 12.7 cm.;
minimum, 6.5 cm. Thickness: maximum, 9 cm.; minimum, 2.3 cm.

Most grinding stones about 13.5 cm. long, 9.5 cm. wide and 6 cm. thick

Material: sandstone; some granite and conglomerate

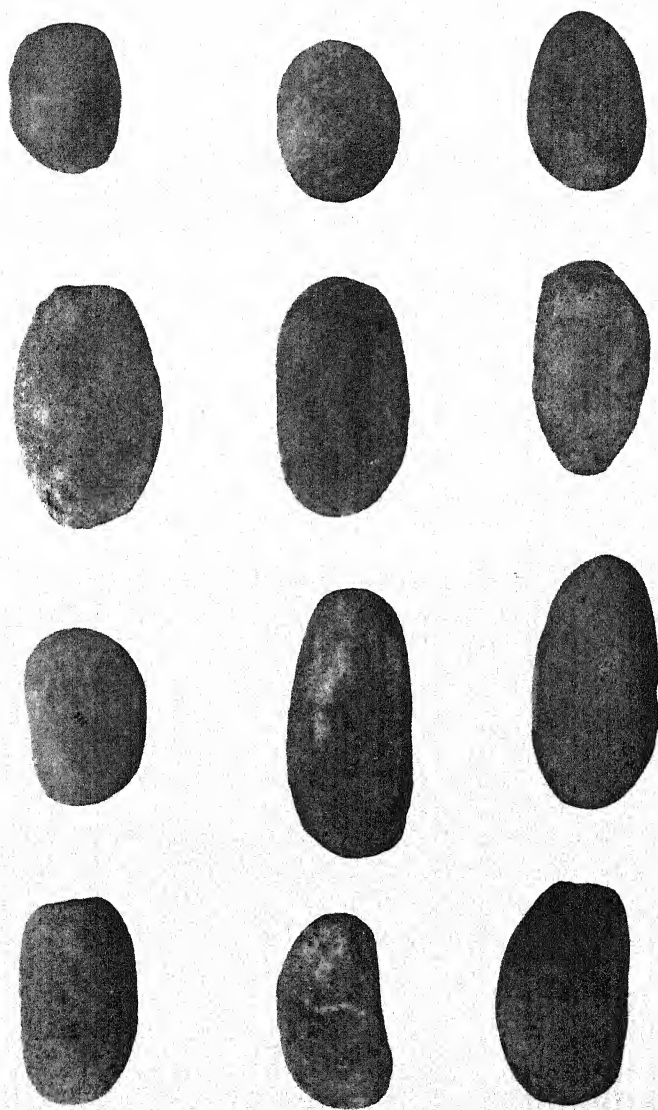


FIG. 108. Grinding stones. Scale 1:6.

OBJECTS OF GROUND AND PECKED STONE—*Continued*

METATES

(Fig. 109)

Open end trough type, trough open at one end only; made from oblong boulder,
bottom and sides rough, trough pitted..... 45

From Site 1..... 33

From Site 2..... 12

Length: maximum, 64 cm.; minimum, 41 cm. Width: maximum, 51 cm.;
minimum, 29 cm. Thickness: maximum, 28 cm.; minimum, 6 cm.

Length of trough: maximum, 57 cm.; minimum, 29 cm. Width of
trough: maximum, 35 cm.; minimum, 18 cm. Depth of trough: maxi-
mum, 7 cm.; minimum, 1 cm.

Material: sandstone; some conglomerate

Metates made from oblong boulders, 14

Metates made from "boat-shaped" boulders, 13

Others made from roundish and irregularly shaped boulders



FIG. 109. Metate. Scale 1:3.

OBJECTS OF GROUND AND PECKED STONE—*Continued*

MORTARS

(Fig. 110)

- (a) Fragment of large rounded pebble with oval depression in middle;
face polished except where broken at one side..... 1
From Site 1..... 1

Length, 13.1 cm.; width, 14 cm.; thickness, 6 cm.

Material: fine-grained granite

- (b) Fragment of metate of open end trough type made from oblong
boulder; pecked depression in center of trough 24 cm. long,
18 cm. wide; bottom and sides of boulder rough..... 1
From Site 2..... 1

Length, 56.5 cm.; width, 32 cm.; thickness, 10 cm.

Material: sandstone

Total from both sites..... 2

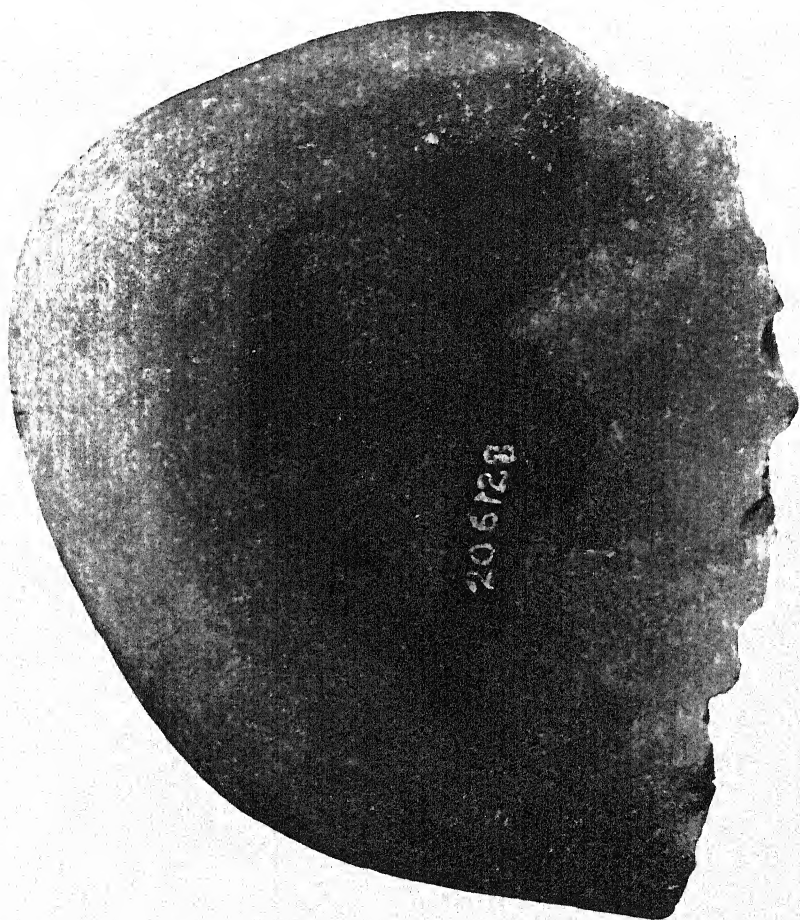


FIG. 110. Mortar. Scale 4:5.

OBJECTS OF GROUND AND PECKED STONE—*Continued*

FLOOR POLISHERS

(Fig. 111)

(a) Roundish polished cobblestones.....	8
From Site 1.....	4
From Site 2.....	4
(b) Irregularly shaped polished cobblestones.....	4
From Site 1.....	1
From Site 2.....	3
(c) Flat, rounded, polished, foot-shaped stones with rounded edges..	13
From Site 2.....	13
Total from both sites.....	<hr/> 25

Length: maximum, 30.3 cm.; minimum, 10 cm. Width: maximum, 20.2 cm.; minimum, 4.2 cm. Thickness: maximum, 6 cm.; minimum, 1.9 cm.

Materials: fine-grained granite, diorite

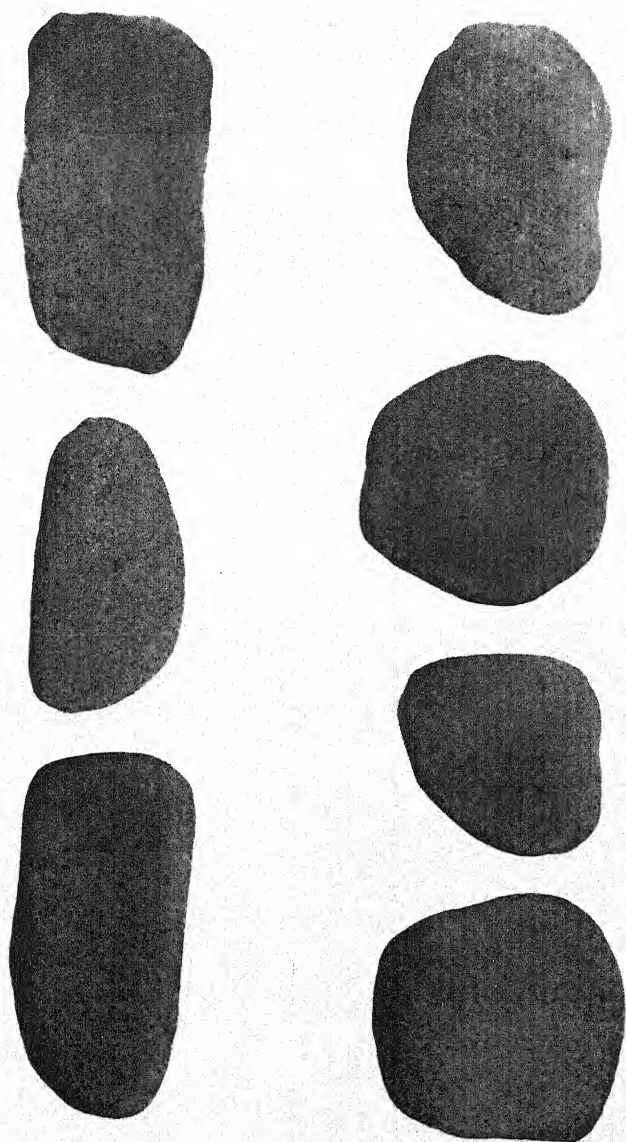


FIG. 111. Floor polishers. Scale 1:6.

OBJECTS OF GROUND AND PECKED STONE—*Continued*

POT POLISHERS

Small, smooth, polished, rounded pebbles 12

From Site 1 8

From Site 2 4

Length: maximum, 11.1 cm.; minimum, 5.2 cm.

Materials: granite, diorite, etc.

LIGHTNING STONES

(Fig. 112)

Smooth, polished, rounded pebbles with some flat surfaces 6

From Site 1 4

From Site 2 2

Length: maximum, 7.5 cm.; minimum, 3.2 cm.

Material: quartz

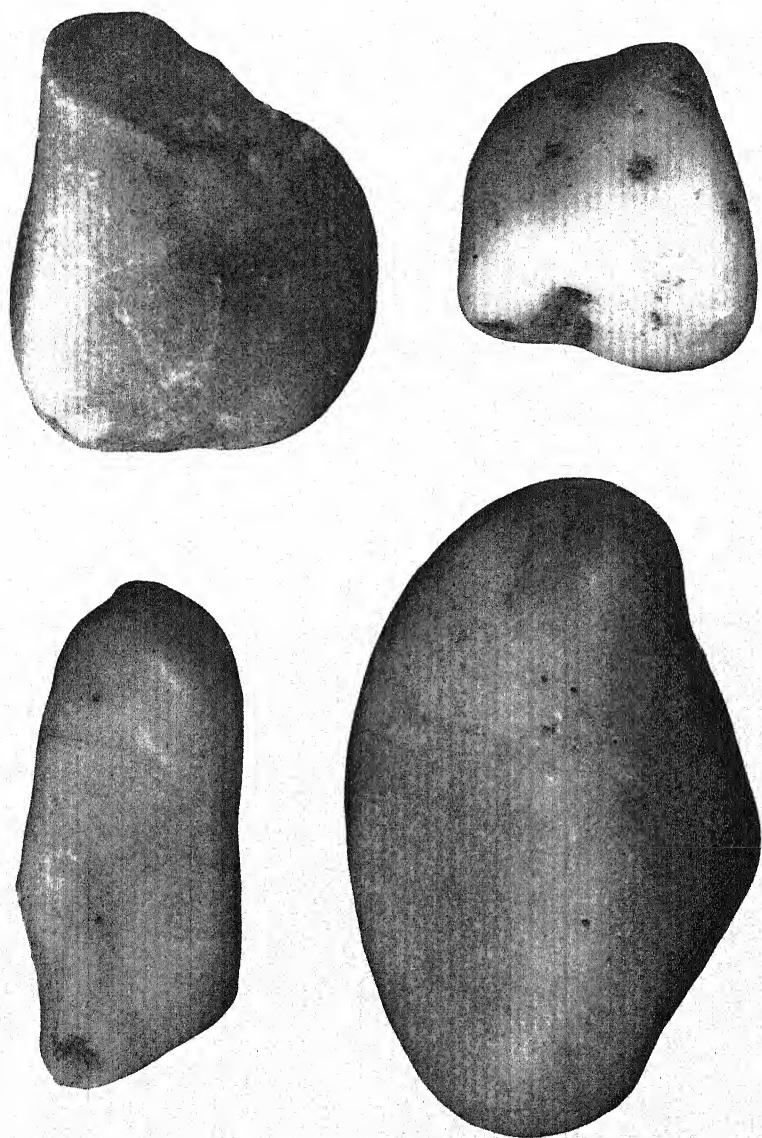


FIG. 112. Lightning stones. Natural size.

OBJECTS OF GROUND AND PECKED STONE—*Continued*

HAMMER STONES

(Fig. 113)

(a) Rough, irregularly shaped, battered and pitted pebbles.....173

From Site 1.....127

From Site 2..... 46

Length: maximum, 13 cm.; minimum, 4.5 cm.

Materials: quartzite, granite

(b) Long, smooth, rounded, oval stones with battered ends..... 6

From Site 1..... 3

From Site 2..... 3

Total from both sites.....179

Length: maximum, 17.4 cm.; minimum, 5.9 cm.

Materials: quartzite, granite

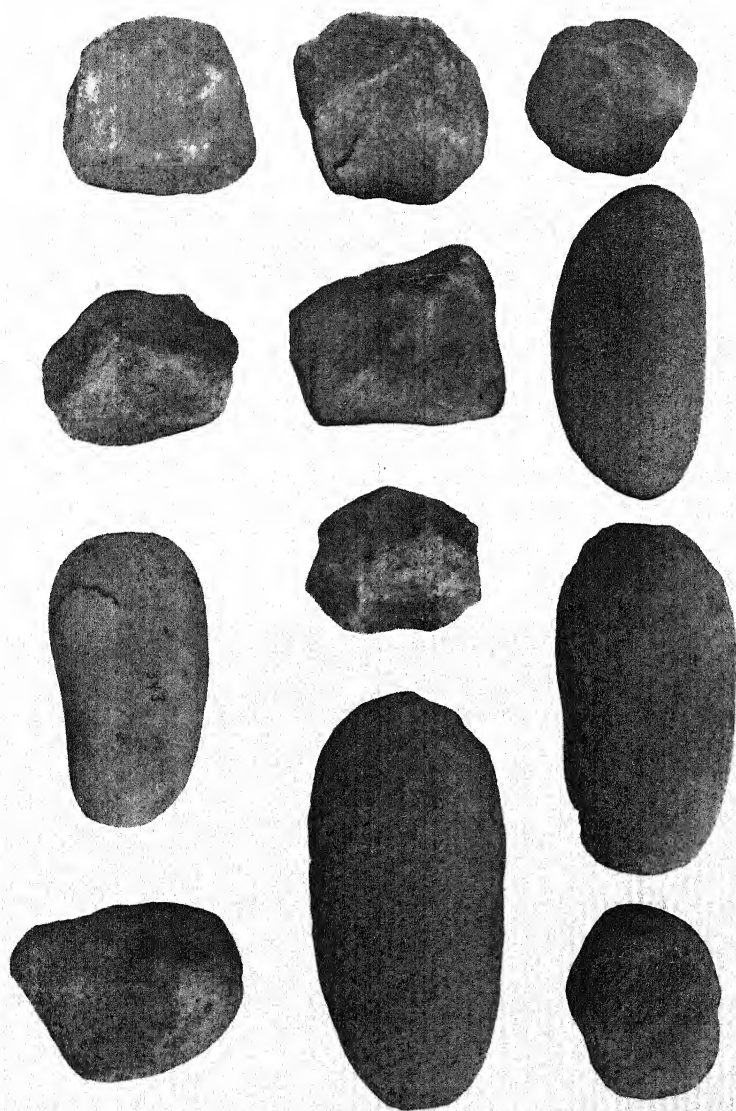


FIG. 113. Hammer stones. Scale 1:3.

OBJECTS OF GROUND AND PECKED STONE—*Continued*

NOTCHED AXES

(Fig. 114)

Flat, roundish pebbles with notch ground in each edge; surfaces smooth,
polished; one end ground and polished to edge..... 13

From Site 1..... 2

From Site 2..... 11

Length: maximum, 21.5 cm.; minimum, 14.2 cm. Width: maximum, 13 cm.;
minimum, 8.5 cm. Thickness: maximum, 4.8 cm.; minimum, 2.4 cm.

Materials: granite, diorite

Four specimens notched in poll end

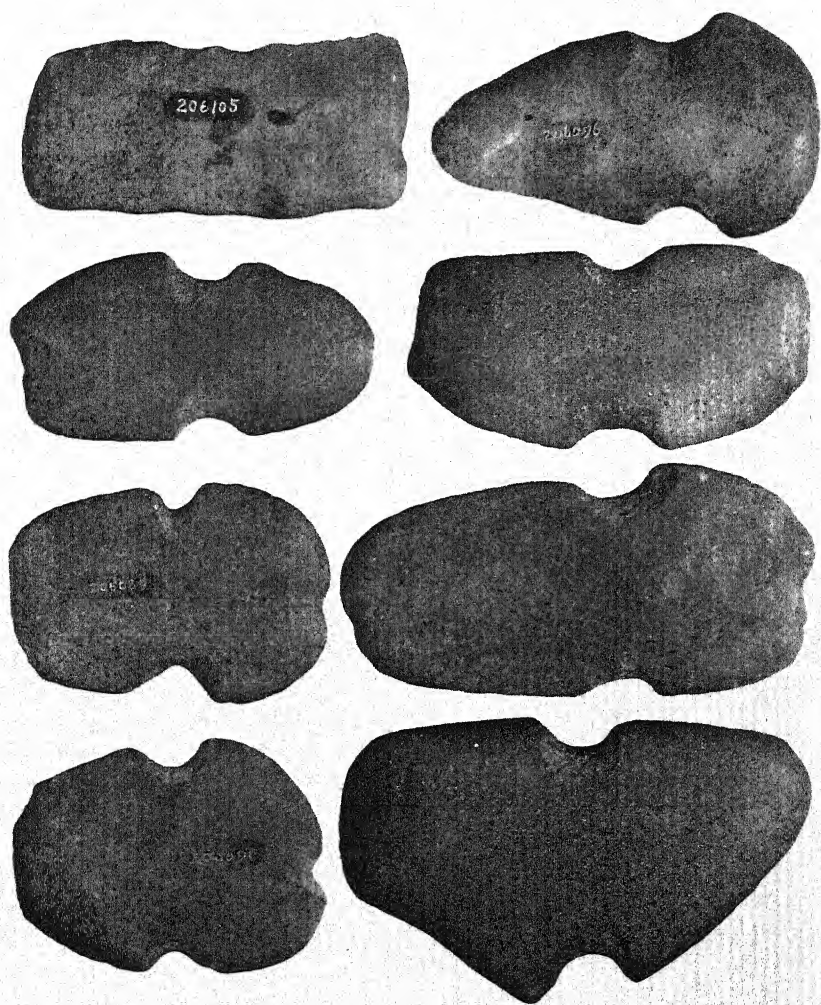


FIG. 114. Ground notched axes. Scale 1:3.

OBJECTS OF GROUND AND PECKED STONE—*Continued*

GROOVED AXES

(Fig. 115)

Long, flat, rounded pebble with groove ground around middle; groove shallow on surfaces, deep on edges; notch in one end, other end ground and polished to edge..... 3

From Site 1..... 2

From Site 2..... 1

Length, 17.2 cm.; width, 7.6 cm.; thickness, 3.5 cm.

Length, 17.5 cm.; width, 7.7 cm.; thickness, 4 cm.

Length, 8.8 cm.; width, 8.5 cm.; thickness, 3.5 cm.

Material: granite

GROOVED CLUB HEADS

(Fig. 115)

Large, long, rounded pebble with full groove pecked in middle; one end battered..... 2

From Site 1..... 1

From Site 2..... 1

Length, 17.8 cm.; width, 8.4 cm.; thickness, 5.5 cm.

Length, 20.4 cm.; width, 10.5 cm.; thickness, 7 cm.

Material: granite

GROOVED MAULS

(Fig. 115)

Oblong pebbles shaped somewhat like rubbing stones, though thicker; shallow, full groove ground around middle; flattish ends pecked and battered.. 6

From Site 1..... 2

From Site 2..... 4

Length: maximum, 14.2 cm.; minimum, 10.7 cm. Width: maximum, 10 cm.; minimum, 7.6 cm. Thickness: maximum, 7.3 cm.; minimum, 5.5 cm.

Materials: granite, quartzite

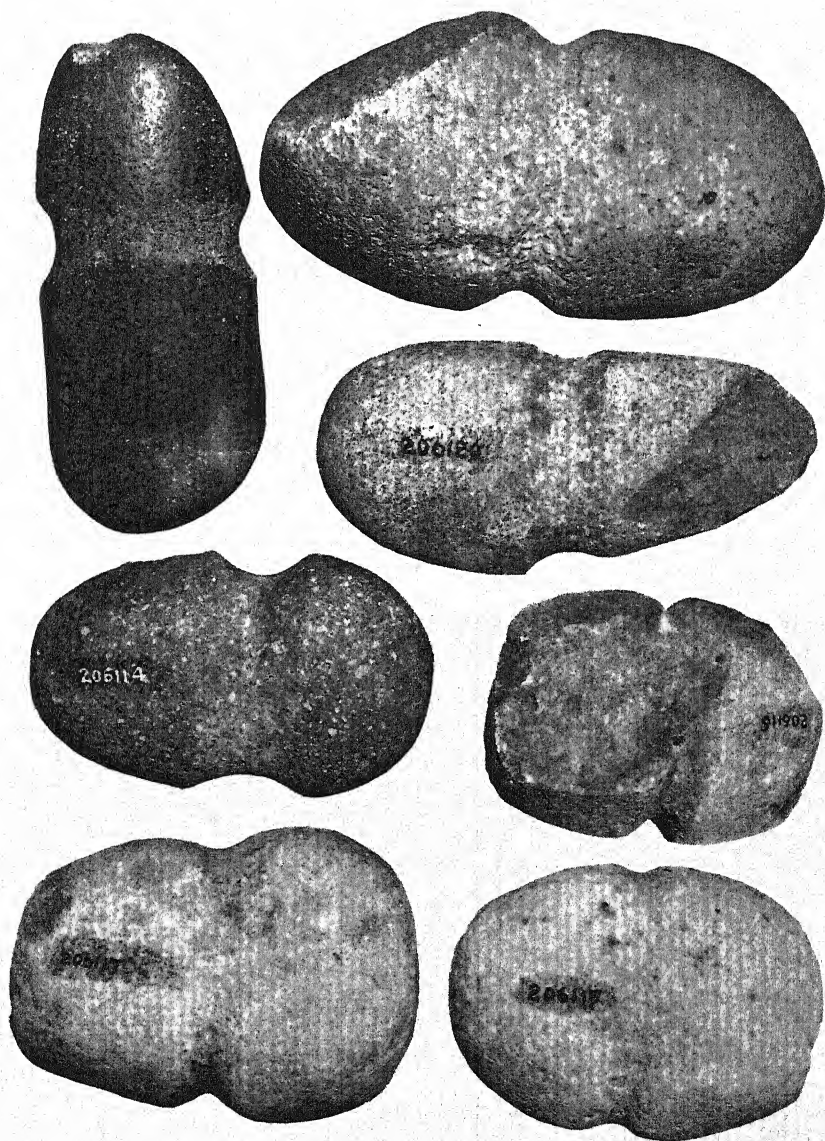


FIG. 115. Grooved tools. Upper left corner, ax; top two objects on right, club heads; bottom two rows, mauls. Scale 1:3.

OBJECTS WITH CRUDE CHIPPING ON ALL MAJOR SURFACES

NOTCHED AXES

(Fig. 116)

Long, oval, rounded pebbles with notched sides; faces unchanneled; faces
pecked and crudely chipped; faces near edge chipped or polished to
edge..... 4

From Site 1..... 4

Length, 14 cm.; width, 9.6 cm.; thickness, 4.9 cm.

Length, 14.6 cm.; width, 8.9 cm.; thickness, 4.9 cm.

Length, 18.5 cm.; width, 8.5 cm.; thickness, 5.3 cm.

Length, 18 cm.; width, 9.5 cm.; thickness, 5.2 cm.

Material: quartzite

NOTCHED HOES

(Fig. 116)

Long, rounded pebbles with notched sides and crude chipping on all surfaces;
rough, edges dull..... 2

From Site 1..... 1

From Site 2..... 1

Length, 18 cm.; width, 10.5 cm.; thickness, 3.8 cm.

Length, 18.5 cm.; width, 9.5 cm.; thickness, 5 cm.

Material: quartzite

NOTCHED MAUL

(Fig. 116)

Long, flattish, rounded stone with notched edges and crude chipping on all
surfaces; one end battered flat, rough; other end chipped flat..... 1

From Site 2..... 1

Length, 15 cm.; width, 11.5 cm.; thickness, 5.4 cm.

Material: quartzite

LOOM WEIGHTS(?)

(Fig. 116)

Flat, rounded pebbles with notched edges; faces crudely chipped; small in size. 3

From Site 1..... 1

From Site 2..... 2

Length, 7.2 cm.; width, 5.3 cm.; thickness, 3 cm.

Length, 10 cm.; width, 6.5 cm.; thickness, 2 cm.

Length, 10.5 cm.; width, 7.5 cm.; thickness, 3.2 cm.

Materials: quartzite, limestone, sandstone

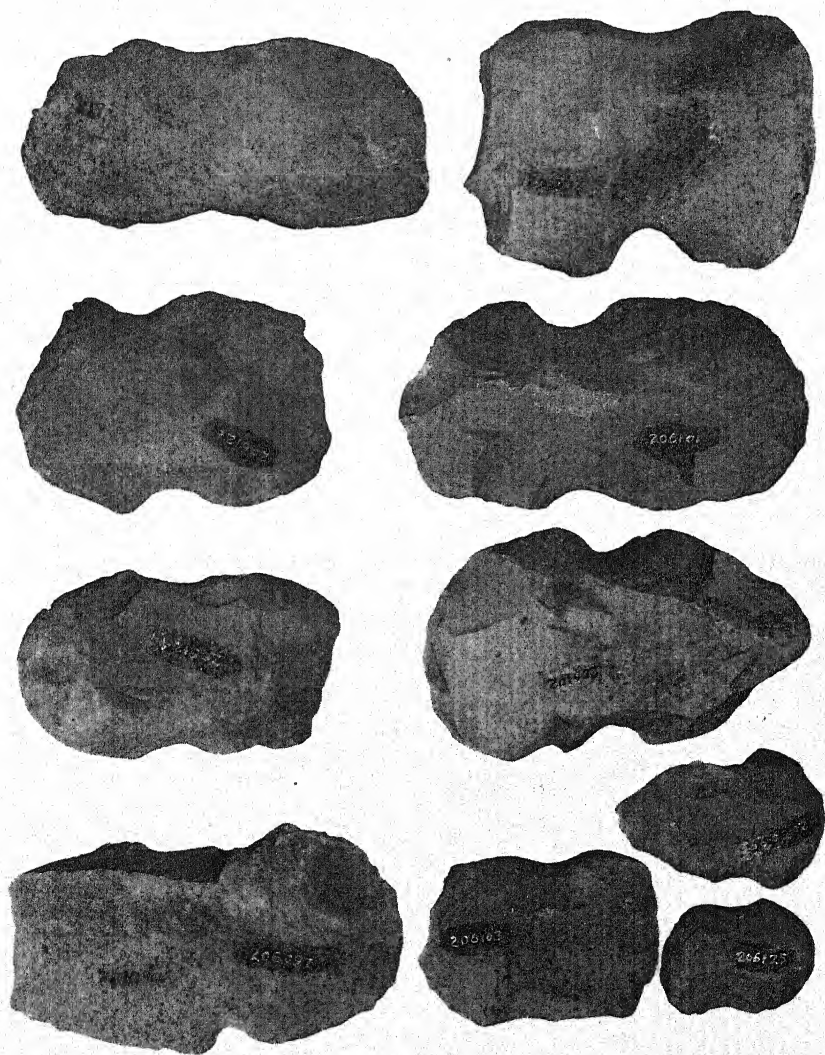


FIG. 116. Notched chipped tools. Left column, axes. Right column, top to bottom, maul, two hoes, three loom weights. Scale 2:7.

OBJECTS WITH SECONDARY CHIPPING ON ALL MAJOR SURFACES

PROJECTILE POINTS AND KNIVES

(Fig. 117)

(a) Straight or slightly expanding stem narrower than the shoulder; slender, relatively thin specimens with deep corner notches set at sharp angle to the long axis of the blade.....	10
From Site 1.....	6
From Site 2.....	4
Others probably of same type because corner notched and of same shape in outline; but stem broken off.....	13
From Site 1.....	7
From Site 2.....	6
Length: maximum, 5.2 cm.; minimum, 2 cm.	
Materials: flint, chert, jasper	
(b) Expanding base, narrower than shoulder; thicker and broader than type described above; one probably knife.....	7
From Site 1.....	4
From Site 2.....	3
Length: maximum, 9.2 cm.; minimum, 2 cm.	
Materials: chert, flint	
(c) Leaf-shaped in outline; square base; relatively long thin blade..	6
From Site 1.....	2
From Site 2.....	4
Length: maximum, 6.3 cm.; minimum, 2.7 cm.	
Materials: chert, flint	
(d) Egg-shaped in outline; pointed at one end, rounded at the other..	1
From Site 2.....	1
Length, 2.3 cm.	
Material: chert	—
Total from both sites.....	37

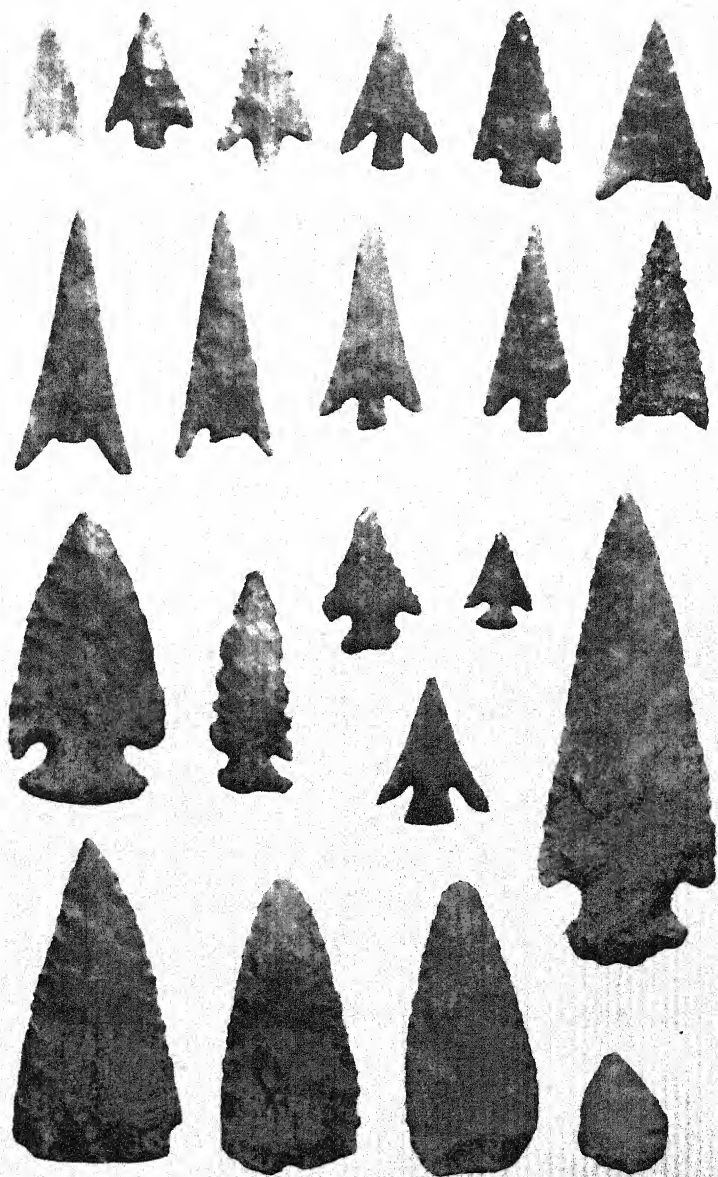


FIG. 117. Projectile points and knives. Top two rows, points with straight stems; third row, points with expanding bases; lower right corner, egg-shaped; rest of bottom row, leaf-shaped. Scale 2:3.

OBJECTS WITH SECONDARY CHIPPING ON ALL MAJOR SURFACES—*Continued*

SCRAPERS

(Fig. 118)

- Roughly oval blades with secondary chipping on all major faces..... 3
 From Site 1..... 1
 From Site 2..... 2
 Lengths: 5.6 cm., 5.3 cm., 3 cm.
 Material: chert

DRILL

(Fig. 118)

- Abrupt, widening flange of drill; drill point broken off..... 1
 From Site 2..... 1
 Length, 2.4 cm.
 Material: chert

GRAVERS

(Fig. 118)

- (a) Short, finely chipped point projecting from broad, squarish base.. 2
 From Site 2..... 2
 Lengths: 3.2 cm., 3.4 cm.
 Material: chert
 (b) Curved, beaked tool, roughly triangular in cross section..... 1
 From Site 1..... 1
 Length, 4.7 cm.
 Material: chert

CHOPPER

(Fig. 118)

- Large, roughly triangular blade with secondary chipping on all major surfaces. 1
 From Site 2..... 1
 Length, 12.1 cm.; width, 8 cm.; thickness, 2.6 cm.
 Material: quartzite

PENDANT(?)

(Fig. 118)

- Cruciform object, double convex in cross section, with secondary chipping on all major surfaces..... 1
 From Site 2..... 1
 Length, 2.6 cm.
 Material: quartzite

OBJECTS WITH SECONDARY CHIPPING ON EDGES CRUDE CHIPPING ON OTHER SURFACES

SIDE SCRAPERS

(Fig. 118)

- Roughly rectangular flakes with secondary chipping along edges and crude chipping on all other surfaces..... 4
 From Site 2..... 4
 Length, 6.5 cm.; width, 5.2 cm.; thickness, 1.5 cm.
 Length, 8.1 cm.; width, 4.6 cm.; thickness, 1 cm.
 Length, 10 cm.; width, 6.6 cm.; thickness, 1.5 cm.
 Length, 13.1 cm.; width, 8.5 cm.; thickness, 3.6 cm.
 Material: quartzite

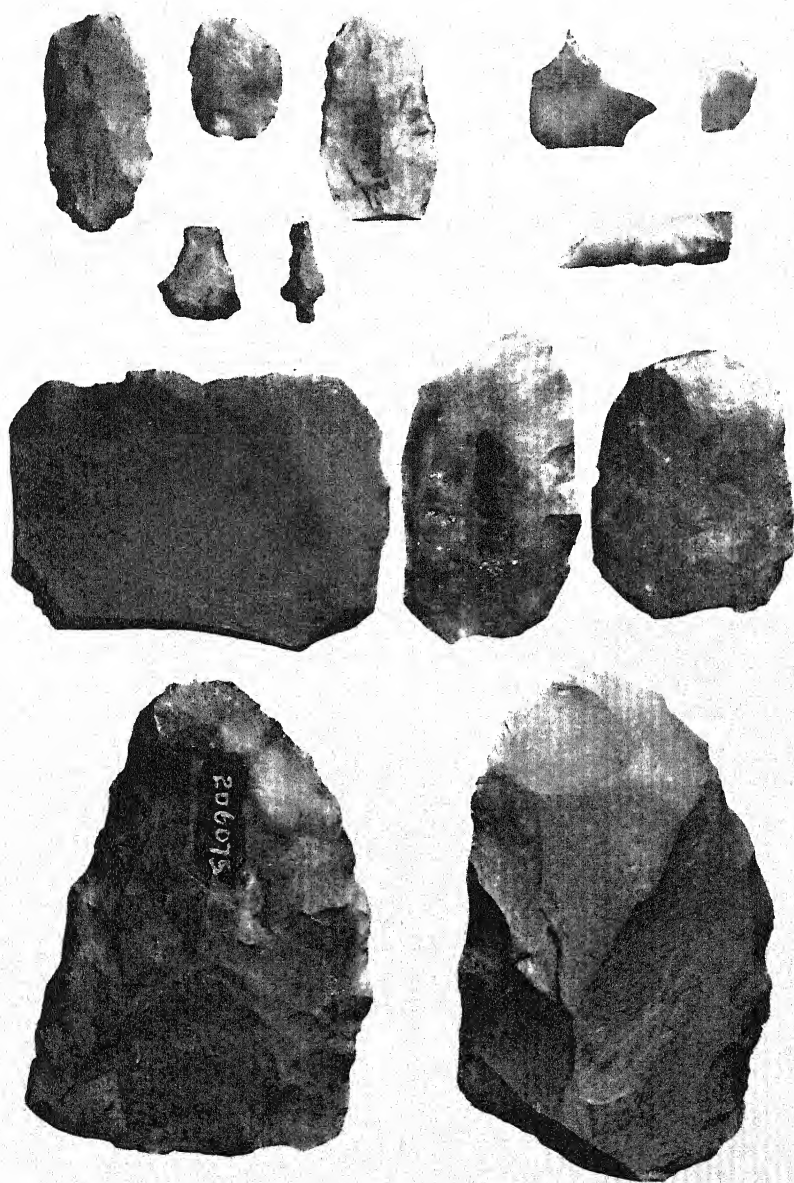


FIG. 118. Miscellaneous chipped implements. Top row (left to right), three scrapers and two gravers; second row (left to right), drill, pendant, and beaked graver; third row, side scrapers; bottom row (left to right), chopper and side scraper. Scale 1:2.

ORNAMENTS

PENDANTS

(Fig. 119)

- (a) Narrow, oblong pendants perforated for suspension; perforation near end..... 2
 From Site 2..... 2
 Length, 6.6 cm.; width, 1.7 cm.; thickness, 0.6 cm.
 Length, 10.1 cm.; width, 2.5 cm.; thickness, 1 cm.
 Material: coal
- (b) Tabular shape with slightly rounded end; perforated at one end for suspension..... 3
 From Site 1..... 1
 From Site 2..... 2
 Length, 4 cm.; width, 2.7 cm.
 Length, 2.2 cm.; width, 1.7 cm.
 Length, 2.8 cm.; width, 1.6 cm.
 Materials: serpentine, gypsum
- (c) Roughly oval-shaped tablet, carved with geometrical design; pierced at one end; colored red..... 1
 From Site 2..... 1
 Length, 5.7 cm.; width, 4 cm.
 Material: gypsum
- (d) Small, cylindrical object with groove around middle..... 1
 From Site 2..... 1
 Length, 2.6 cm.; width, 1.1 cm.
 Material: coal
- (e) Animal teeth with perforations through roots for suspension.... 2
 From Site 2..... 2
 Lengths: 3.6 cm., 2.6 cm.
 Material: lower molar and canine of coyote, *Canis* sp.
- (f) Curved, rod-like object with one thin, flattish end where it is perforated; half of previous perforation shown in broken corner; hole drilled from one side; specimen square in cross section, "tusk-like" in shape..... 1
 From Site 1..... 1
 Length, 3.5 cm.
 Material: shell
- Total from both sites..... 10

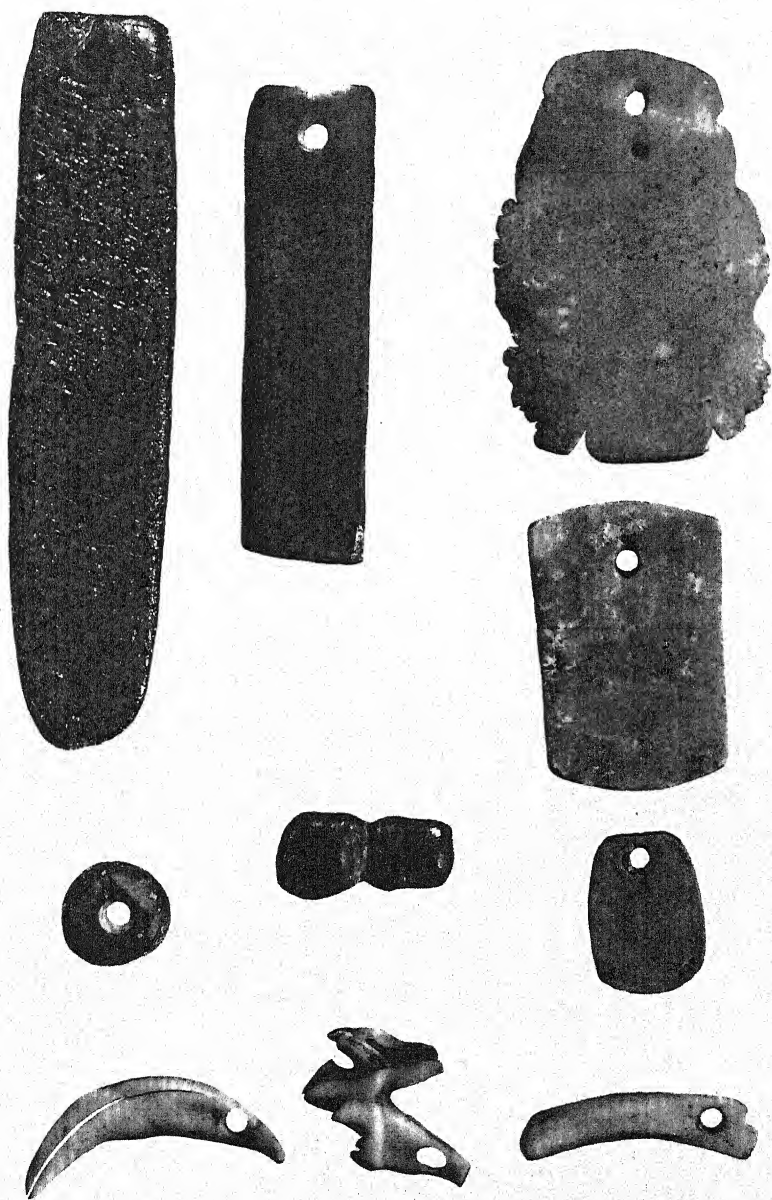


FIG. 119. Ornaments. Pendants and jet bead. Natural size.

ORNAMENTS—Continued

DISK

(Fig. 120)

Bone disk, one surface convex, other grooved; possibly button..... 1

From Site 1..... 1

Diameter, 1.7 cm.

Material: bone

BEADS

(Fig. 120)

(a) Perforated disk, roughly circular..... 2

From Site 1..... 1

From Site 2..... 1

Diameters: 1 cm., 0.7 cm.

Material: turquoise

(b) Perforated disk, roughly circular..... 1

From Site 1..... 1

Diameter, 0.6 cm.

Material: bone

(c) Round bead, flattish around perforation..... 1

From Site 1..... 1

Diameter, 1 cm.

Material: coal

(d) Tubular beads made from hollow section of bone with ends ground smooth..... 2

From Site 1..... 1

From Site 2..... 1

Lengths: 3 cm., 2.7 cm.

Material: bone

(e) *Olivella* shells with the spire ground off, for stringing..... 5

From Site 2..... 5

Length, 1.1 cm.

Material: *Olivella*

(f) Snail shell with hole through center of helix..... 1

From Site 2..... 1

Diameter, 1.5 cm.

Material: *Oreohelix houghi*

Total from both sites..... 12

BRACELET

(Fig. 120)

Section of a marine bivalve; curving, rectangular in cross section..... 1

From Site 1..... 1

Length, 7.2 cm. (specimen fragmentary)

Material: *Glycymeris gigantea*

GAMBLING PIECES(?)

(Fig. 120)

Elliptical-shaped slips of bone; two have cross hatching on one side and are polished on the other; the other two are rough on one side and polished on the other; hachure scratched on surface..... 4

From Site 1..... 3

From Site 2..... 1

Lengths: 3.3 cm., 3.1 cm., 2.9 cm., 2.7 cm.

Material: bone

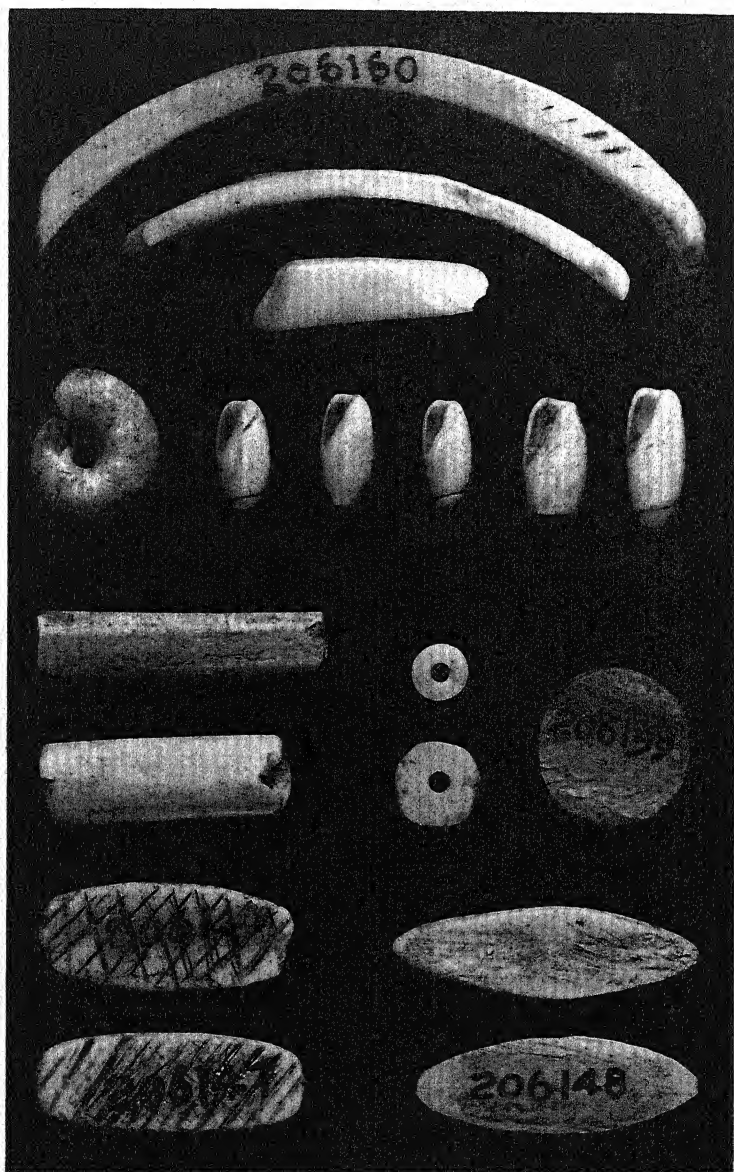


FIG. 120. Ornaments. Top row, portions of shell bracelet; next row, shell beads; third row (left to right), two bone beads, two turquoise beads, and bone disk; two bottom rows, gambling pieces(?). Scale 5:4.

OBJECTS OF BAKED CLAY

WORKED SHERDS

(Fig. 121)

(a) Roughly circular in shape; edges ground smooth.....	6
From Site 1.....	2
From Site 2.....	4
Diameter: maximum, 8.5 cm.; minimum, 4.7 cm.	
Materials: Lino gray, Abajo red-on-orange	
(b) Roughly rectangular in outline; one with beginning of perforation at one end; edges smooth.....	15
From Site 1.....	13
From Site 2.....	2
Length: maximum, 8.6 cm.; minimum, 3.1 cm. Width: maximum, 7.4 cm.; minimum, 2.2 cm.	
Material: Abajo red-on-orange	
Total from both sites.....	21

FIGURINE

(Fig. 121)

Lump of clay, roughly in shape of an animal's body with projections possibly representing legs, tail, and neck.....	1
From Site 2.....	1

Length, 3.2 cm.

Material: baked clay

PIPES

(Fig. 121)

"Cloud Blower" type; tubular or funnel shape; greatest diameter just below bowl end; tapers gradually to mouth end; round throughout length in cross section; surface unslipped and undecorated; three have small holes for stem, one has large; color mottled gray and black; one tapers abruptly from bowl to mouth end.....	4
From Site 1.....	4

Lengths: 8.5 cm., 6 cm., 6.2 cm., 7 cm.

Diameters: 2.9 cm., 2.8 cm., 2.5 cm., 4 cm. (at bowl end)

Material: pottery similar to Lino gray

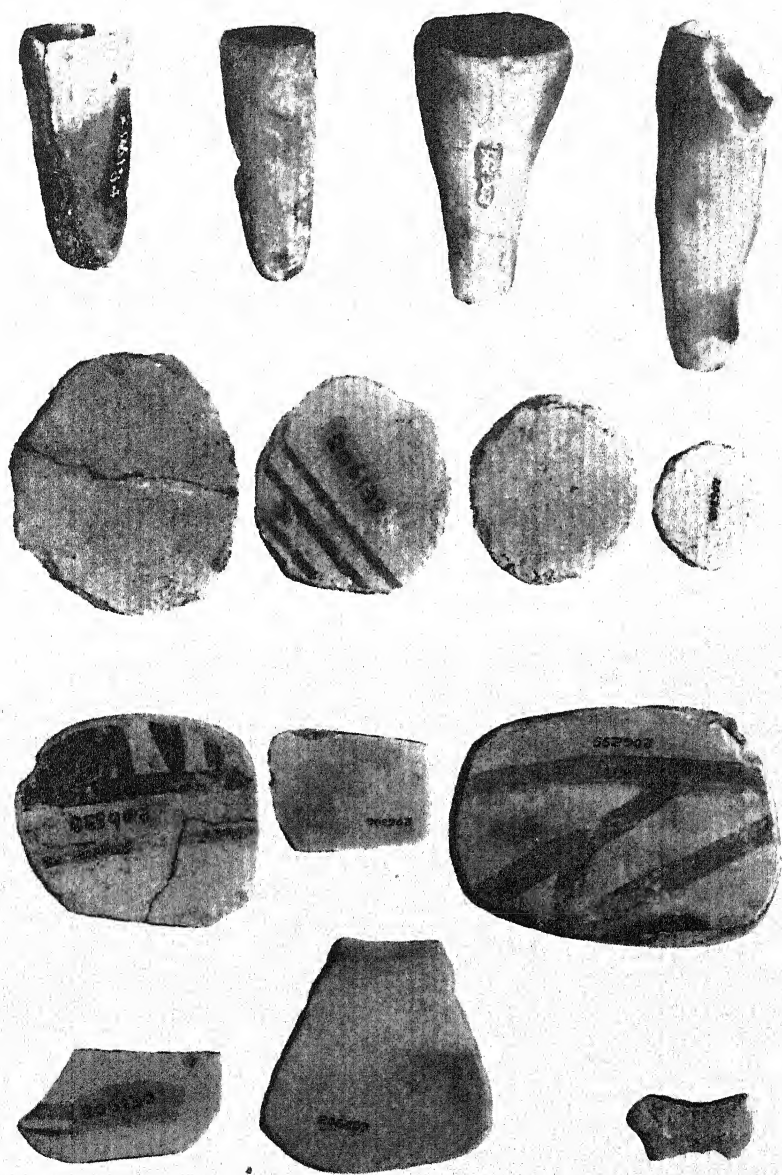


FIG. 121. Objects of baked clay. Top row, pipes; second and third rows, worked sherds; last row (left to right), two worked sherds and a figurine. Scale 3:5.

OBJECTS OF WORKED BONE

WHISTLES

(Fig. 122)

Hollow bone with one head ground off at right angles to long axis of shaft; hole cut and drilled in shaft just below other head 7

From Site 1 4

From Site 2 3

Lengths: 13.5 cm., 13.7 cm.

Material: tibiae of *Lepus alleni*

FLESHERS OR END SCRAPERS

(Fig. 122)

Shafts of large long bones, split and with one end beveled off 7

From Site 1 1

From Site 2 6

Length: maximum, 22.2 cm.; minimum, 7 cm.

Material: mammal bones

NEEDLES OR BODKINS

(Fig. 122)

Made from flattish split bone with one end ground to sharp point; two have eyes drilled through 0.5 cm. from blunt end, other 1.5 cm. from blunt end. In only one specimen was the natural groove of the bone deepened to facilitate drilling the hole; two drilled from both sides; others from one side only 4

From Site 2 4

Lengths: 17.3 cm., 17.6 cm., 20.5 cm., 14.5 cm.

Material: mammal bones

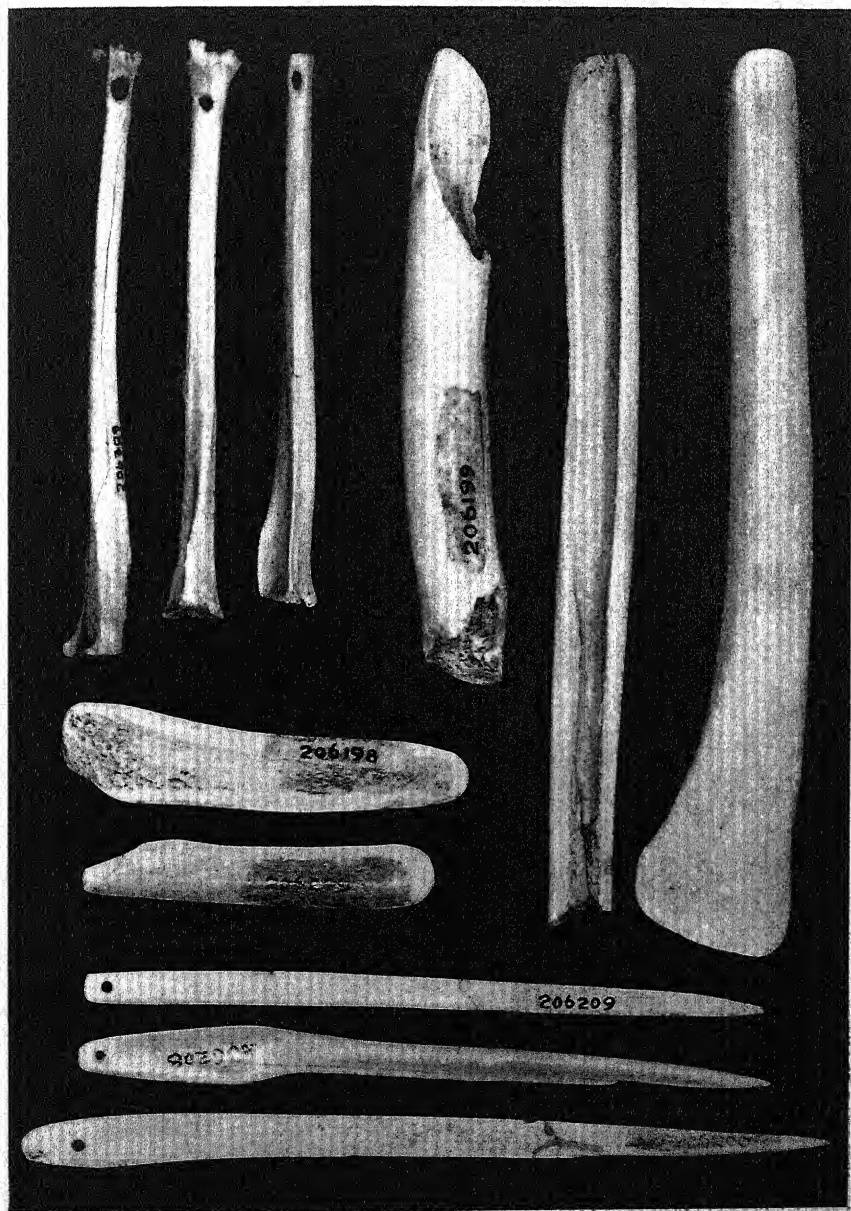


FIG. 122. Objects of worked bone. Upper left corner, three whistles; center and right side, fleshers; at bottom, three needles. Scale 1:2.

OBJECTS OF WORKED BONE—*Continued*

BONE AWLS

(Fig. 123)

- (a) Bone splinter ground to sharp point 8
 From Site 2 8
 Length: maximum, 12 cm.; minimum, 7.5 cm.
 Material: mammal bones
- (b) Points of split bone awls; head of bone broken off 11
 From Site 2 11
 Length: maximum, 17.1 cm.; minimum, 3.7 cm.; most about 6 cm. long
 Material: mammal bones
- (c) Hollow bone; head wholly removed; other end ground to sharp point 2
 From Site 1 1
 From Site 2 1
 Lengths: 6.3 cm., 7.7 cm.
 Material: bird bones
- (d) Head of bone wholly removed; one end ground to flat spatula shape; other end ground and polished to point; spatula end broad, rounded 6
 From Site 2 6
 Length: maximum, 17.3 cm.; minimum, 8.9 cm.
 Material: mammal bones
- (e) Head of bone almost wholly removed; other end ground and polished to sharp point; made from split bone 7
 From Site 1 1
 From Site 2 6
 Length: maximum, 17.6 cm.; minimum, 6.6 cm.
 Material: mammal bones
- (f) Head of bone unworked except by original splitting; other end ground and polished to point 28
 From Site 1 4
 From Site 2 24
 Length: maximum, 27.1 cm.; minimum, 4.5 cm.
 Material: *Odocoileus hemionus* (mule deer) metatarsi, *Ovis canadensis* (mountain sheep); *Antilocapra americanus* (pronghorn antelope)
- (g) Head of bone left intact; other end ground to point 2
 From Site 2 2
 Lengths: 13.2 cm., 18.7 cm.
 Material: *Odocoileus hemionus* (mule deer) metatarsus
 Notches, a feature which is considered significant in Mogollon culture, were found on several awls of various types.

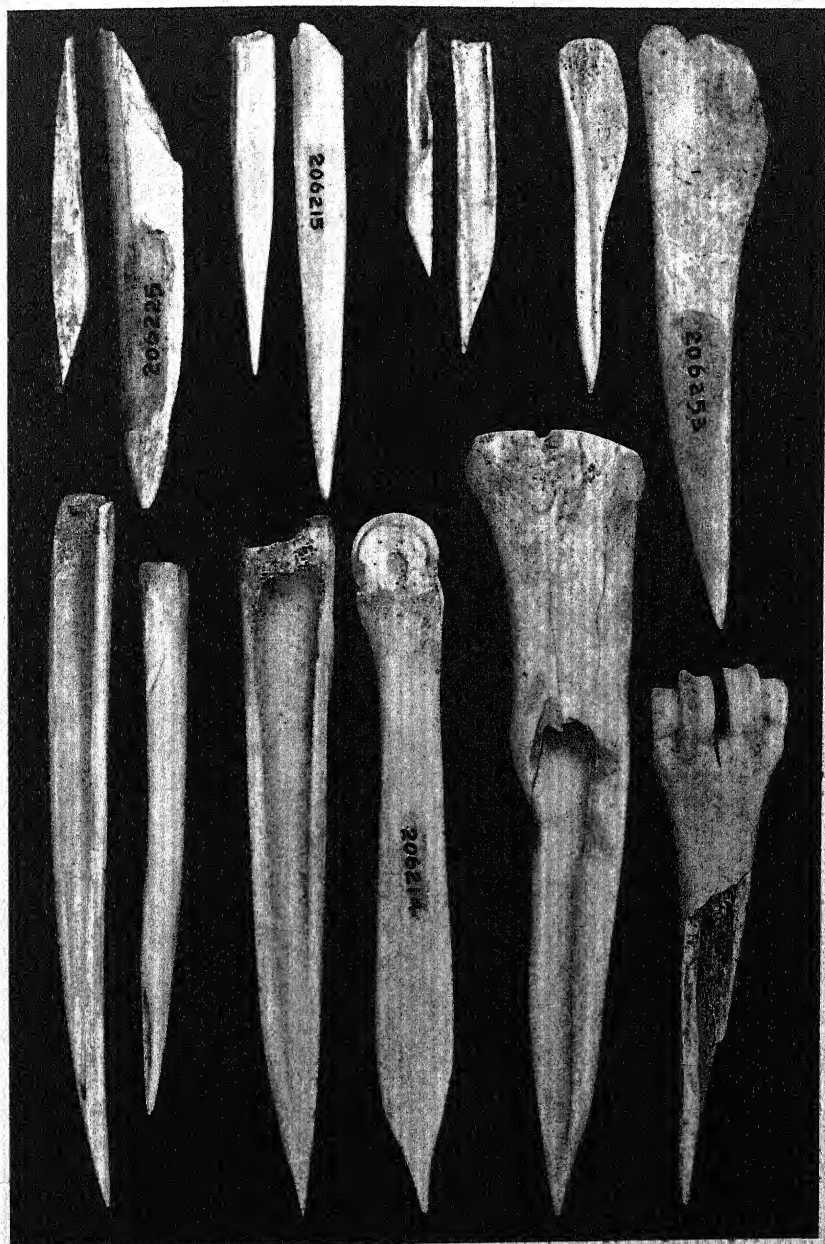


FIG. 123. Bone awls. Top row (left to right, in groups of two), types *a*, *b*, *c*, *d*; bottom row (left to right, in groups of two), types *e*, *f*, *g*. Scale 1:2.

OBJECTS OF WORKED BONE—*Continued*

PUNCHES OR FLAKERS

(Fig. 124)

Various types of awls which have been dulled by use; some battered as if used for flaking..... 7

From Site 1..... 3

From Site 2..... 4

Length: maximum, 13 cm.; minimum, 4.2 cm.

Material: mammal bones

RIB FLAKER

(Fig. 124)

Rib with point sharpened and base ground flat..... 1

From Site 2..... 1

Length, 22.4 cm.

Material: mammal bone

BONE PROJECTILE POINT

(Fig. 124)

Flat bone object shaped like stemmed projectile point..... 1

From Site 1..... 1

Length, 4 cm.

Material: mammal bone

PERFORATED JAW

(Fig. 124)

Jaw bone containing teeth, perforated at ramus for suspension..... 1

From Site 2..... 1

Length, 7 cm.

Material: *Urocyon cinereoargenteus* (gray fox), lower right mandible

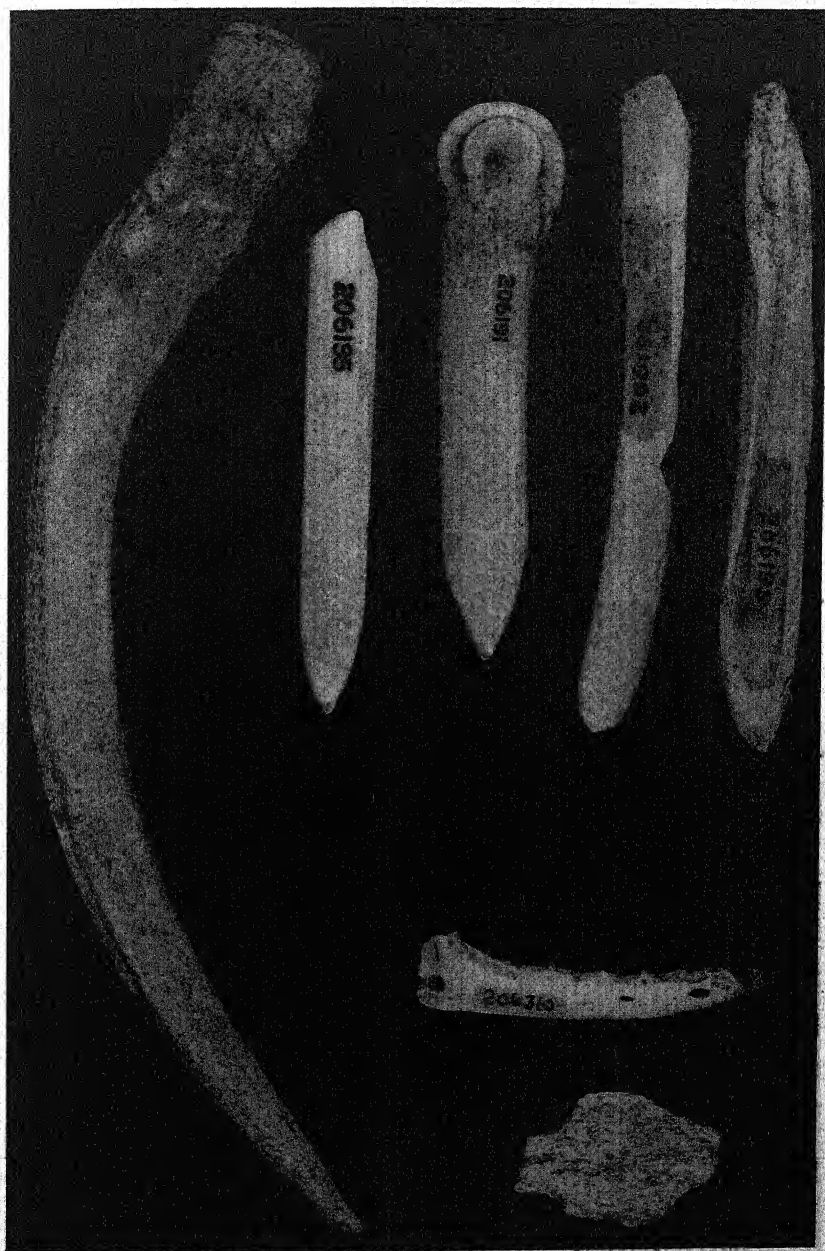


FIG. 124. Miscellaneous bone objects. On left, rib flaker; top row, punches; next row, perforated jaw; bottom row, projectile point. Scale 7:10.

LOCATIONS AND ASSOCIATIONS OF ARTIFACTS BY SITES

SITE 1

- Kiva I: Flaker, pipe, worked sherds, pendant, projectile point, stone cube, hammer stones, pot polishers, metates, manos, rubbing stones.
- Kiva II: Projectile points and knives.
- Pit House A: Worked sherds, awls, graver, projectile points, axes, hammer stones, pot polishers, manos, pipe.
- Pit House B: Flaker, pipe, worked sherds, whistles, gambling pieces, projectile points, hoe, axes, stone ball, hammer stones, floor polisher, grinding stone, rubbing stone, manos.
- Pit House C: Worked sherds, fleshers, projectile points, maul, hammer stones, floor polisher, grinding stones, manos, rubbing stones.
- Pit House D: Flaker, worked sherd.
- Surface rooms: Pipe, worked sherds, bracelet, awl, pendants, carved pebble, projectile points, club heads, axes, stone ball, floor polishers, pot polishers, lightning stones, metates, manos, rubbing stones, grinding stones, mortar, hammer stones.

SITE 2

- Pit House A: Flakers, awls, fleshers, gambling pieces, pendants, knives, projectile points, ax, pot cover, pot polisher, floor polisher, metate, manos.
- Pit House B: Flaker, awls, flesher, whistles, paint cup, hammer stones, metates, manos.
- Pit House C: Awls, beads, pendants, projectile points, finger stone, grinding stone.
- Pit House E: Flaker, awls, side scraper, projectile points.
- Pit House F: Pigments,¹ worked sherds, needle, pot cover, hammer stones, lightning stones.
- Pit House G: Awls, maul, pot cover, hammer stones, pot polisher, metate, mano.
- Pit House H: Pigments, awls, hammer stones, pot polisher, metate, mano.
- Surface rooms: Awls, fleshers, flakers, whistles, metates, manos, rubbing stones, grinding stones, floor polishers, pot polishers, pot covers, axes, mauls, club heads, projectile points, drill, gravers, chopper.

IDENTIFICATION OF UNWORKED BONE

Remains of the following animals were found at Sites 1 and 2:

<i>Canis</i> sp. (domestic dog)	<i>Lepus californicus</i> (jack-rabbit)
<i>Canis</i> sp. (coyote)	<i>Sylvilagus</i> (cotton-tail)
<i>Felis</i> sp.	<i>Ursus horribilis</i> (grizzly bear)
<i>Odocoileus hemionus</i> (mule deer)	<i>Marmota</i> (woodchuck)
<i>Ovis canadensis</i> (mountain sheep)	<i>Cynomys</i> (prairie dog)
<i>Lepus alleni</i> (jack-rabbit)	Birds
	Sciuridae

¹ Pigments consist of azurite, hematite, and malachite.

IV. POTTERY¹

PAINTED POTTERY

(Figs. 125-137)

Three kinds of painted pottery were found at Site 1: Abajo red-on-orange, La Plata black-on-orange and Lino black-on-gray.

The types of painted pottery recovered from Site 2 consisted of the following: Abajo red-on-orange, Abajo polychrome, and Lino black-on-gray. A basket-handled bowl and two sherds of La Plata black-on-orange were also encountered.

Some of the above types (Abajo red-on-orange, La Plata black-on-orange, and Abajo polychrome) have not been thoroughly described, although the first two types have been mentioned and illustrated (Morris, 1919 and 1927; Guernsey, 1931, p. 91).

Mr. J. O. Brew, of Peabody Museum, Harvard University, was the first to assign names to the Abajo red-on-orange and Abajo polychrome wares. A complete description of these wares and his excavations will appear in a publication now being prepared for press by Mr. Brew; but I include in Appendix C a general statement concerning his work in Utah, which he was generous enough to send to me for use in this report. The following is a summary of what he says about the Abajo red-on-orange pottery:

The designs of Abajo red-on-orange pottery are mostly red (from hematite) on an unslipped orange background. There is a considerable variation in the color of the designs, the color ranging from red through purple to black. The pottery from Alkali Ridge, Utah, demonstrates the danger of classifying pottery on color alone, since there are twenty-four factors which may affect the color of fired clay (Shepard). Although there is a great range in color, Mr. Brew prefers to classify this ware under the name of Abajo red-on-orange. Statistical tabulation showed that the favorite designs were (in descending order of importance): broad, parallel wavy lines running across the bowl, around the bowl in circular formation, or (in three instances) spirally up from the bottom to the top; strings of triangles (arranged like the parallel wavy lines); key patterns, single or double, again arranged in parallel straight rows, parallel circular rows, or parallel spirals; checkerboards. There is a similarity between the designs on this pottery and those on Basket Maker II baskets; hence, it is easy to discover the immediate source of the designs on the eighth century Abajo pottery.

¹In collaboration with John Rinaldo.

To supplement the above, I add a few remarks about these types. Abajo red-on-orange, a type of pottery with designs in red on an orange background, occurs (in the light of present knowledge) in Basket Maker and early Pueblo I sites ranging from eastern Utah to the vicinity of Durango, Colorado, and as far south as Shiprock, New Mexico (specimens in collections of Field Museum, and Morris, 1927, p. 188, *b*). The red used for the designs varies from red to chocolate. The exteriors of bowls are generally lighter in color than the interiors, and are not so smooth.

Abajo polychrome is a pottery with designs in black and red on an orange background. Only seven sherds of this ware were recovered and they came from the older site (Site 2).

La Plata black-on-orange may be roughly defined as pottery having designs in dense black on an orange background.

Lino black-on-gray has been described several times elsewhere (Colton and Hargrave, 1937, pp. 194-195; Hawley, 1936, p. 22).

The designs of Abajo and La Plata wares are more easily comprehended if seen. Therefore, a description is omitted and illustrations are substituted (Figs. 125-134). Likewise, two graphs are included (Figs. 135, 136). These represent the percentile distribution of the design elements. It is interesting to note that out of nineteen design elements, sixteen are shared in common by Abajo and La Plata. Likewise, some of the Abajo designs are very similar to those found on Lino black-on-gray pottery (Fig. 137).

These two wares consist of bowls, seed-bowls, narrow-mouthed jars, and pitchers with gourd handles (evidence for latter from sherds).

The rims of bowls made from the decorated wares—Abajo red-on-orange and La Plata black-on-orange—curved inward slightly as on bowls made from the undecorated wares. On the other hand, squared lip surfaces predominated over rounded lip surfaces for these wares. A decided minority of rims from the decorated wares are from jar forms.

Very few handles for the decorated wares were found; most of these were strap handles. Other forms which occurred were loop handles, indented hand-holds, and gourd tips.

Lino black-on-gray occurred mostly in bowl forms in which the rim curved inward slightly. Rounded lip surfaces predominated over squared lip surfaces on these vessels also.

Since no careful microscopic or chemical tests have been made on the slip, paint, or temper of these two orange wares, it is not possible to make any statement concerning these important details.

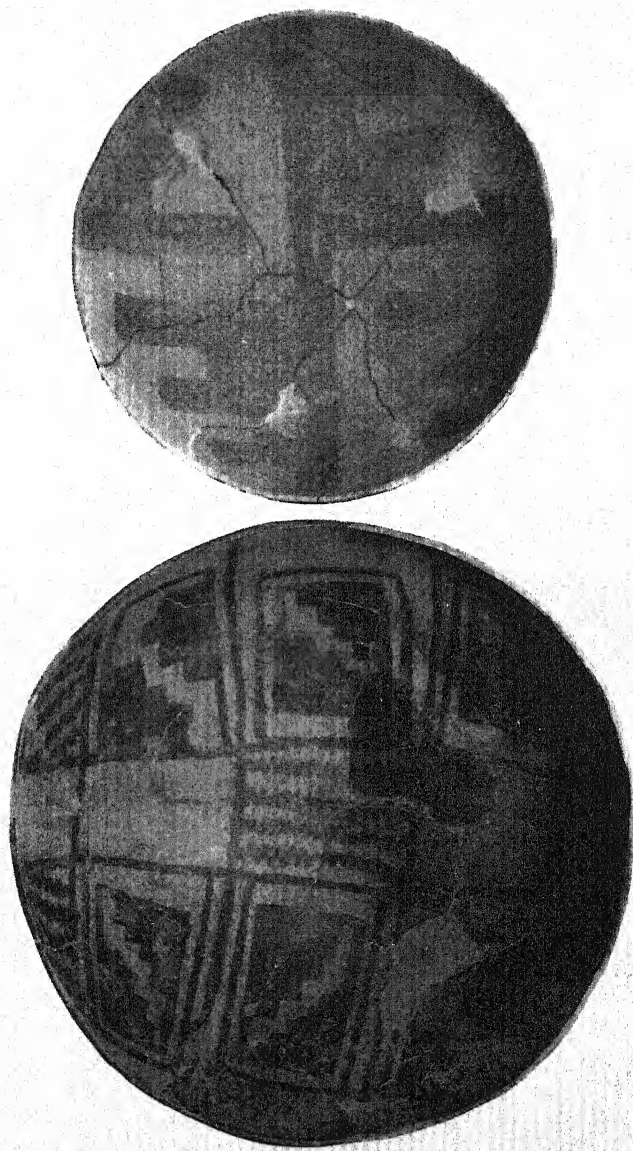


FIG. 125. Abajo red-on-orange pottery, Site 2. Bowls. Scale 1:3.

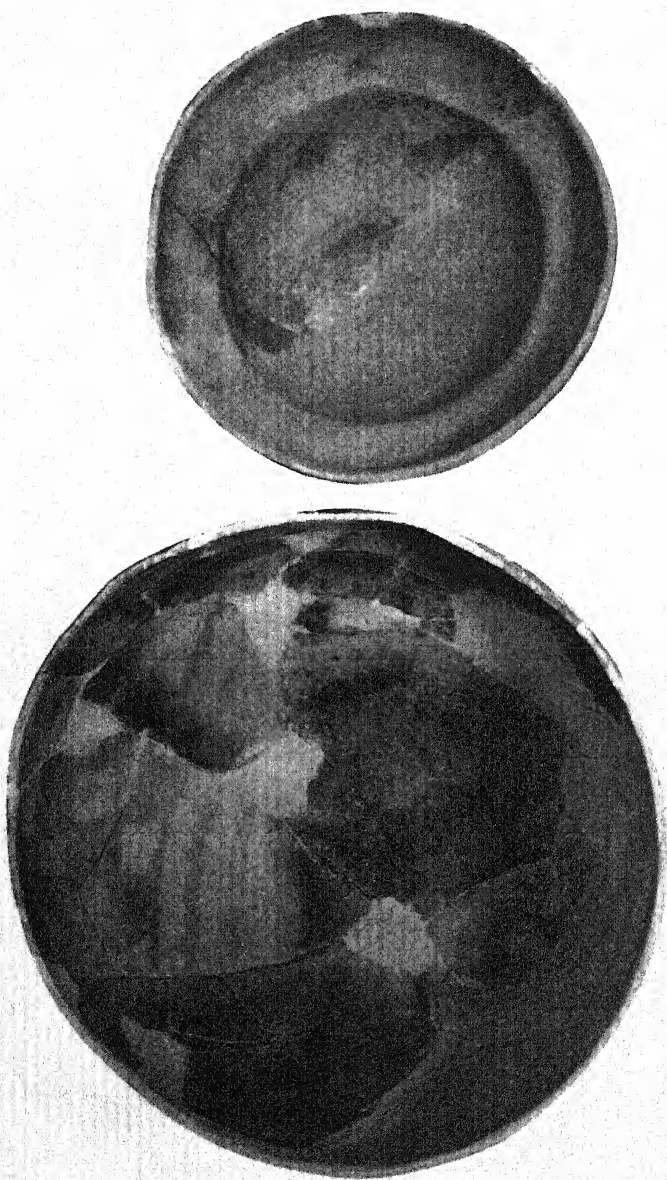


FIG. 126. Abajo red-on-orange pottery, Site 2. Bowls. Scale 1:2.

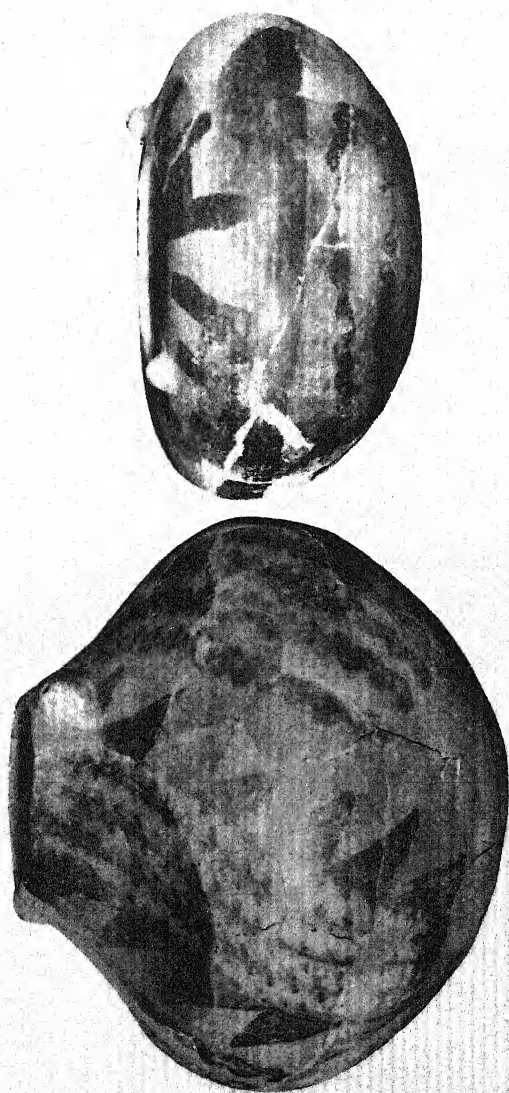


FIG. 127. Abajo red-on-orange pottery, Site 2. Jars. Scale 1:3.

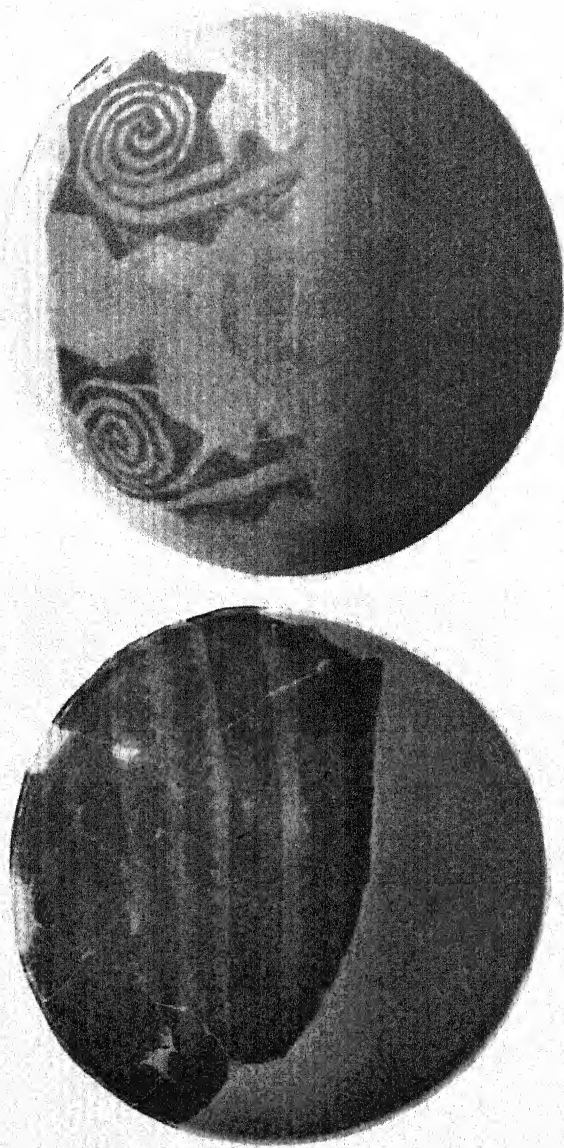


FIG. 128. Abajo red-on-orange pottery, Site 2. Bowls. Scale 1:3.



FIG. 129. La Plata black-on-orange pottery, Site 2. Basket-handled bowl. Scale 3:5.

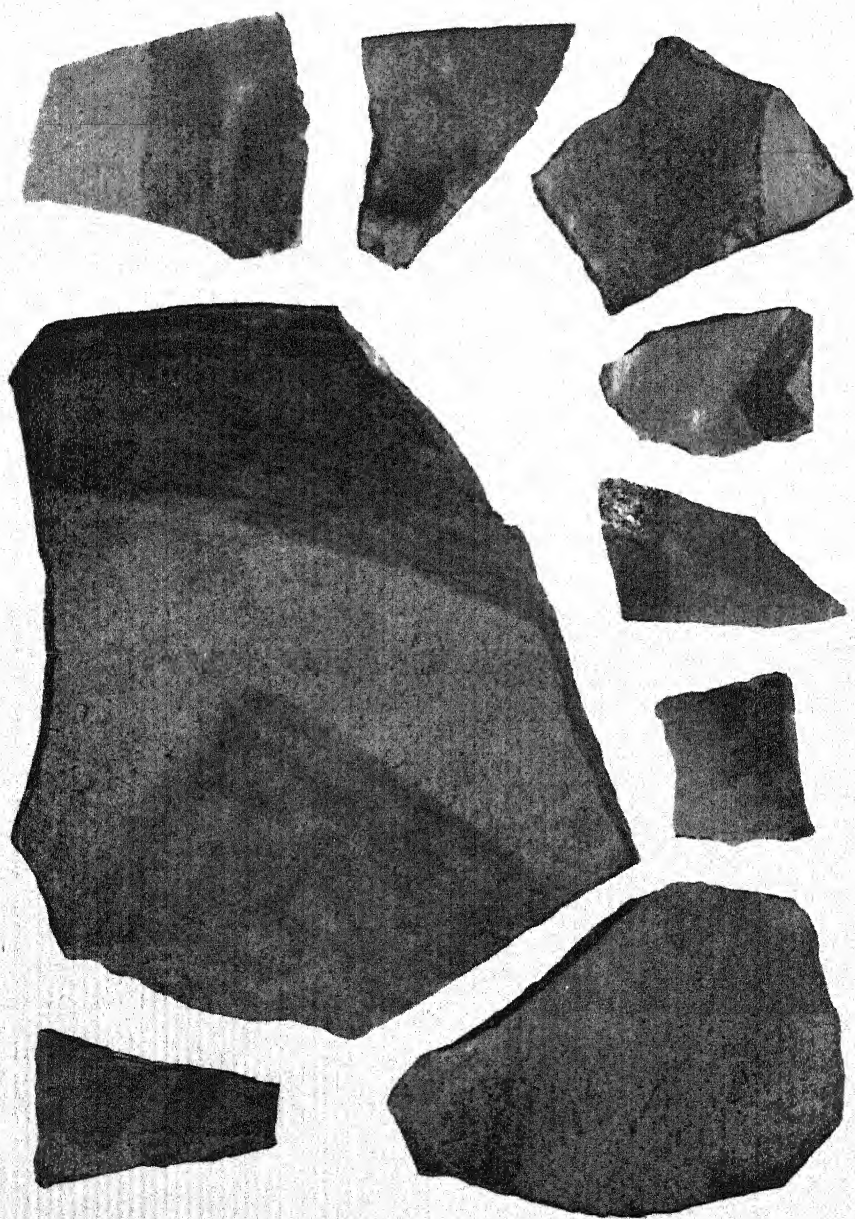


FIG. 130. Abajo polychrome potsherds, Site 2.

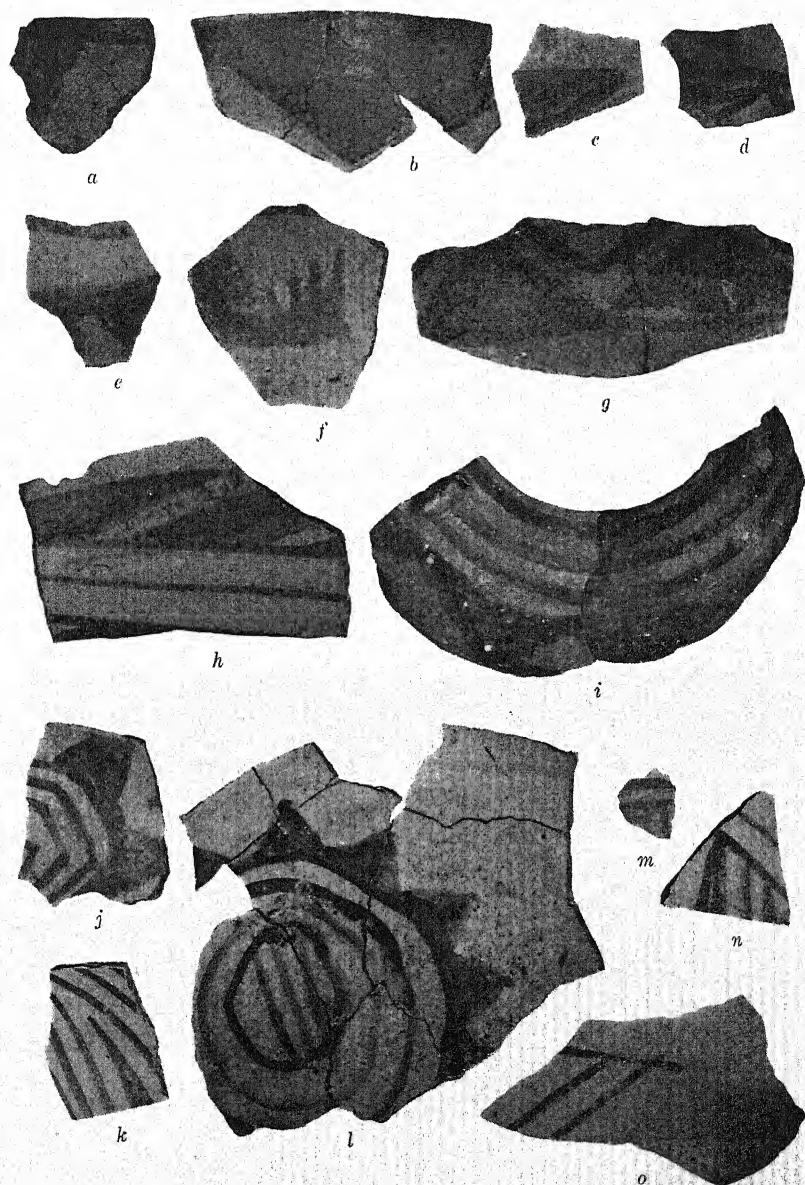


FIG. 131. Abajo red-on-orange potsherds. *a, b*, stripe and triangle dropped from rim; *c-f*, triangles, solid, barred, pendent and ticked; *g*, triangles framed by parallel lines; *h*, line of pennants; *i*, parallel lines edged with solid triangles; *j*, spiral or concentric circles; *k*, chevrons; *l*, concentric circles edged with solid triangles; *m*, basket-weave; *n*, panels of stripes; *o*, terminated parallel lines.

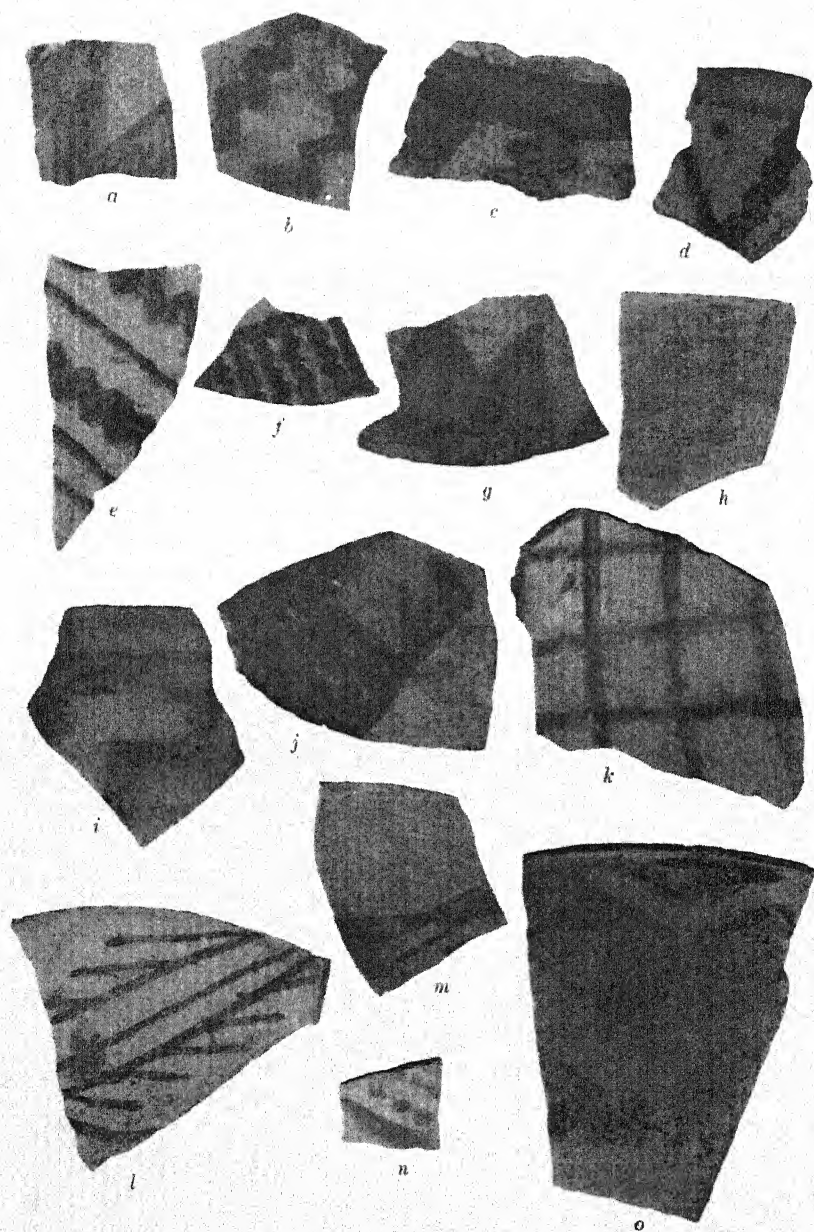


FIG. 132. Abajo red-on-orange potsherds. *a-c*, zigzag (wavy), single, parallel and paneled; *d, e*, straight and wavy lines, intersecting or parallel; *f*, squiggly hatch; *g*, sawtooth line; *h, i, o*, stepped element, stepped lines; *j*, key; *k*, checkerboard; *l, m*, fringed lines or solids; *n*, polka dots with framing lines.

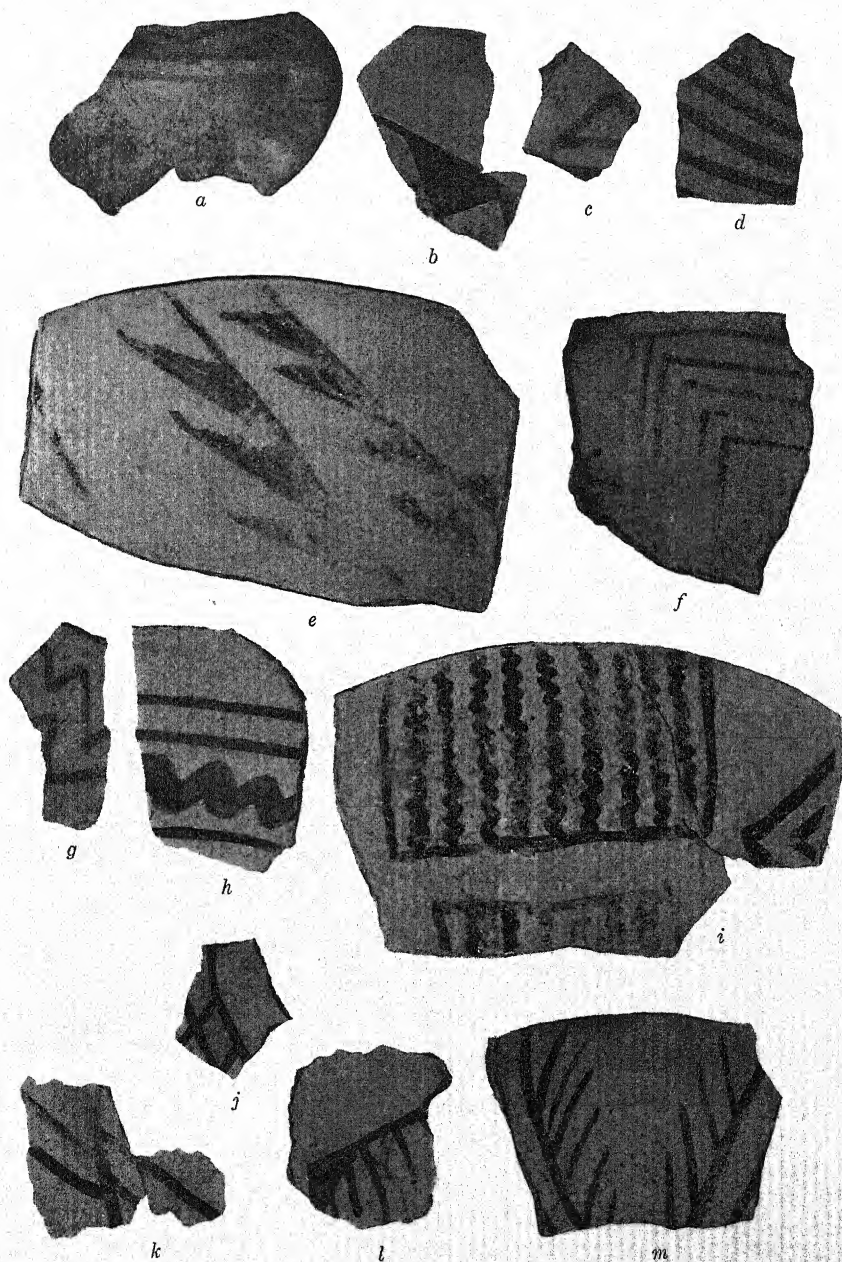


FIG. 133. La Plata black-on-orange potsherds. *a*, triangles framed with parallel lines; *b*, *c*, triangles, pendent and barred; *d*, basket-weave; *e*, lines of pennants; *f*, chevrons; *g*, zigzag (wavy); *h*, parallel straight and wavy; *i*, squiggly hatch; *j*, checkerboard; *k*, offset parallel lines; *l*, *m*, fringed solids or lines.

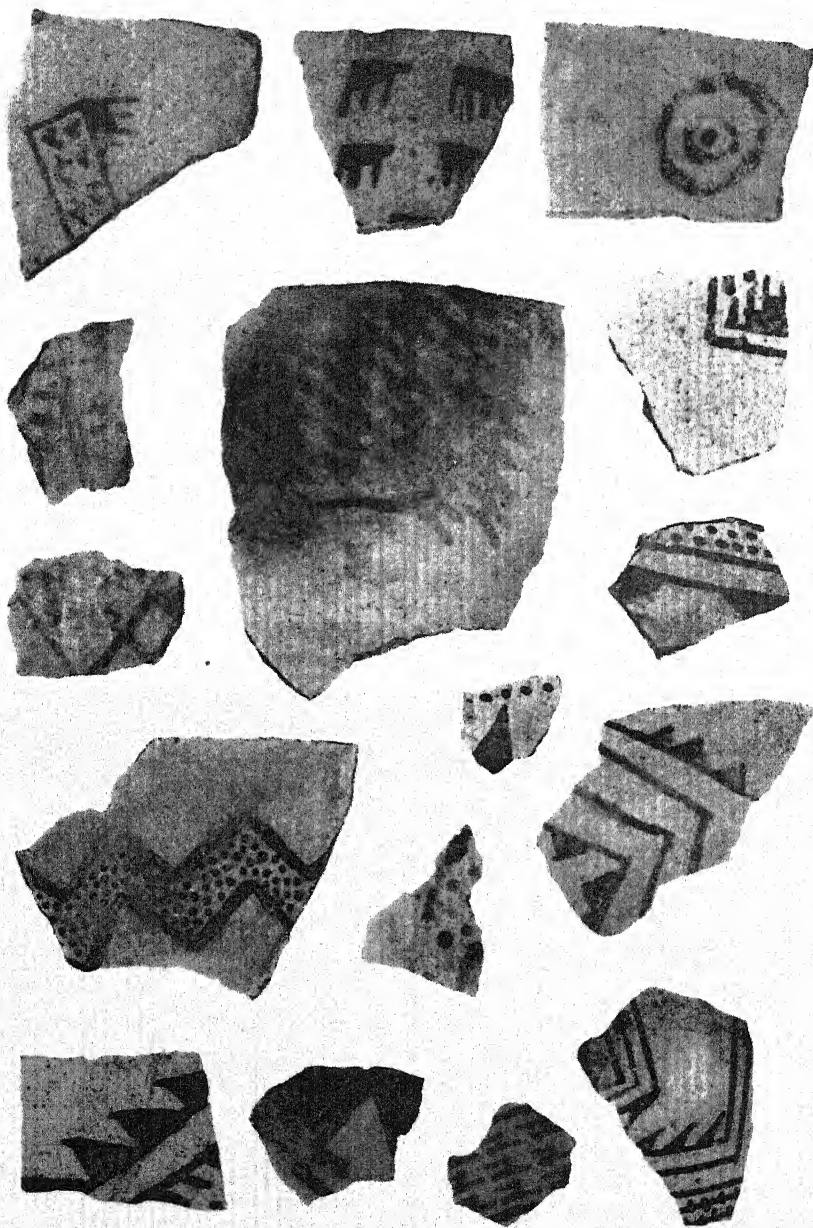


FIG. 134. Lino black-on-gray potsherds. Sites 1 and 2.

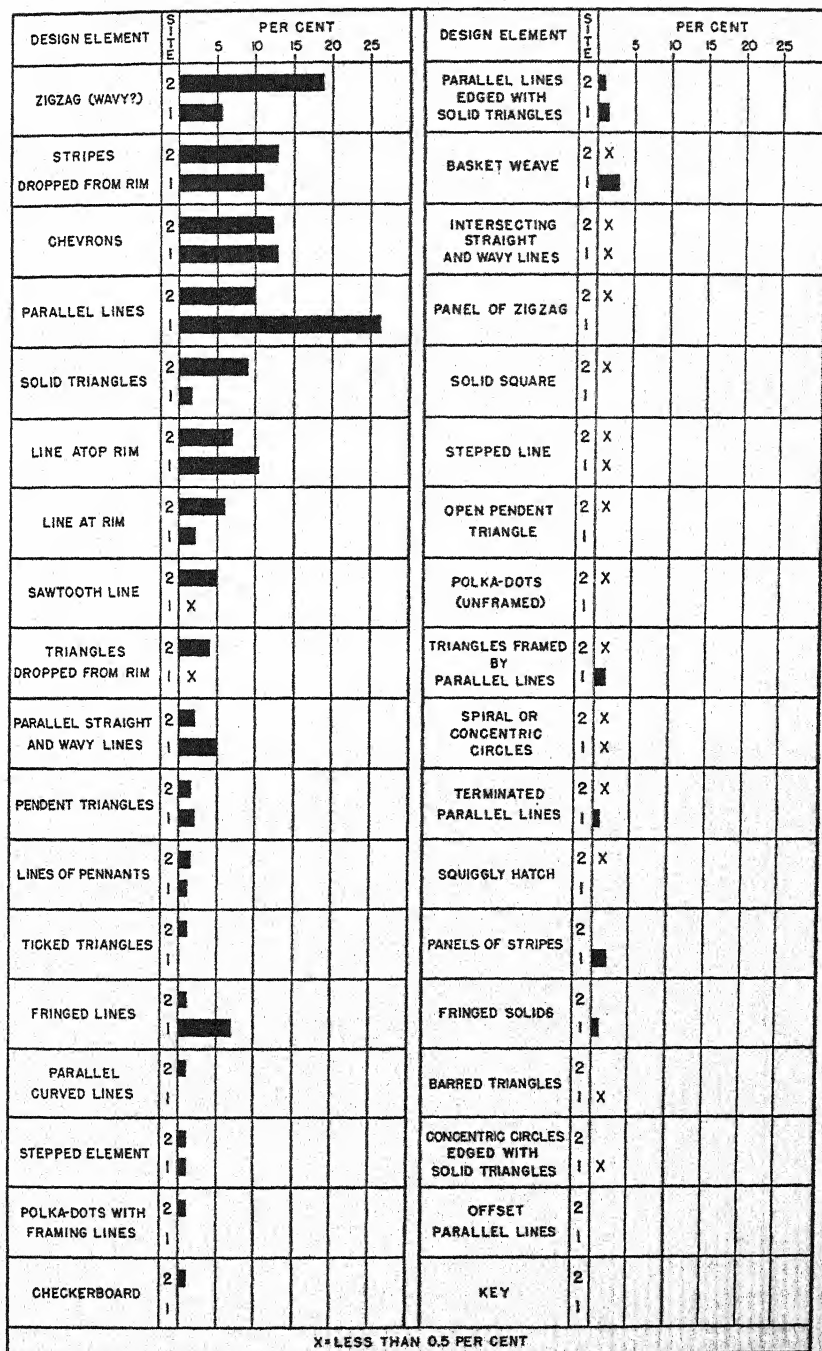


FIG. 135. Graph representing distribution (in percentages) of Abajo red-on-orange design elements. Sites arranged chronologically. X represents less than one-half of one per cent.

DESIGN ELEMENT	T Y P E	PER CENT					DESIGN ELEMENT	T Y P E	PER CENT				
		5	10	15	20	25			5	10	15	20	25
ZIGZAG (WAVY?)	A	■					PARALLEL LINES EDGED WITH SOLID TRIANGLES	A	■				
	L	■	■					L					
STRIPES	A	■	■				BASKET WEAVE	A	■				
DROPPED FROM RIM	L	■	■					L	■				
CHEVRONS	A	■	■				INTERSECTING STRAIGHT AND WAVY LINES	A	X				
	L	■	■					L					
PARALLEL LINES	A	■	■	■	■	■	PANEL OF ZIGZAGS	A					
	L	■	■	■	■	■		L					
SOLID TRIANGLES	A	■					SOLID SQUARE	A					
	L	■						L					
LINE ATOP RIM	A	■	■				STEPPED LINE	A	X				
	L	■	■					L					
LINE AT RIM	A	■					OPEN PENDENT TRIANGLE	A					
	L							L					
SAWTOOTH LINE	A	X					POLKA-DOTS (UNFRAMED)	A					
	L							L					
TRIANGLES DROPPED FROM RIM	A	X					TRIANGLES FRAMED BY PARALLEL LINES	A	■				
	L							L					
PARALLEL STRAIGHT AND WAVY LINES	A	■	■				SPIRAL OR CONCENTRIC CIRCLES	A	X				
	L	■	■					L					
PENDENT TRIANGLES	A	■					TERMINATED PARALLEL LINES	A	■				
	L	■						L	■				
LINE OF PENNANTS	A	■					SQUIGGLY HATCH	A					
	L	■						L	■				
TICKED TRIANGLES	A						PANELS OF STRIPES	A	■				
	L	■						L					
FRINGED LINES	A	■	■				FRINGED SOLIDS	A	■				
	L	■	■					L	■				
PARALLEL STEPPED ELEMENT	A						BARRED TRIANGLES	A	X				
	L							L	■				
STEPPED ELEMENT	A	■					CONCENTRIC CIRCLES EDGED WITH SOLID TRIANGLES	A	X				
	L							L					
POLKA-DOTS WITH FRAMING LINES	A						OFFSET PARALLEL LINES	A					
	L							L	■				
CHECKERBOARD	A						KEY	A					
	L	■						L	■				

X=LESS THAN 0.5 PER CENT

A=ABAJO RED-ON-ORANGE

L=LA PLATA BLACK-ON-ORANGE

FIG. 136. Graph representing (in percentages) relationship of Abajo red-on-orange and La Plata black-on-orange. Site 1. X represents less than one-half of one per cent.

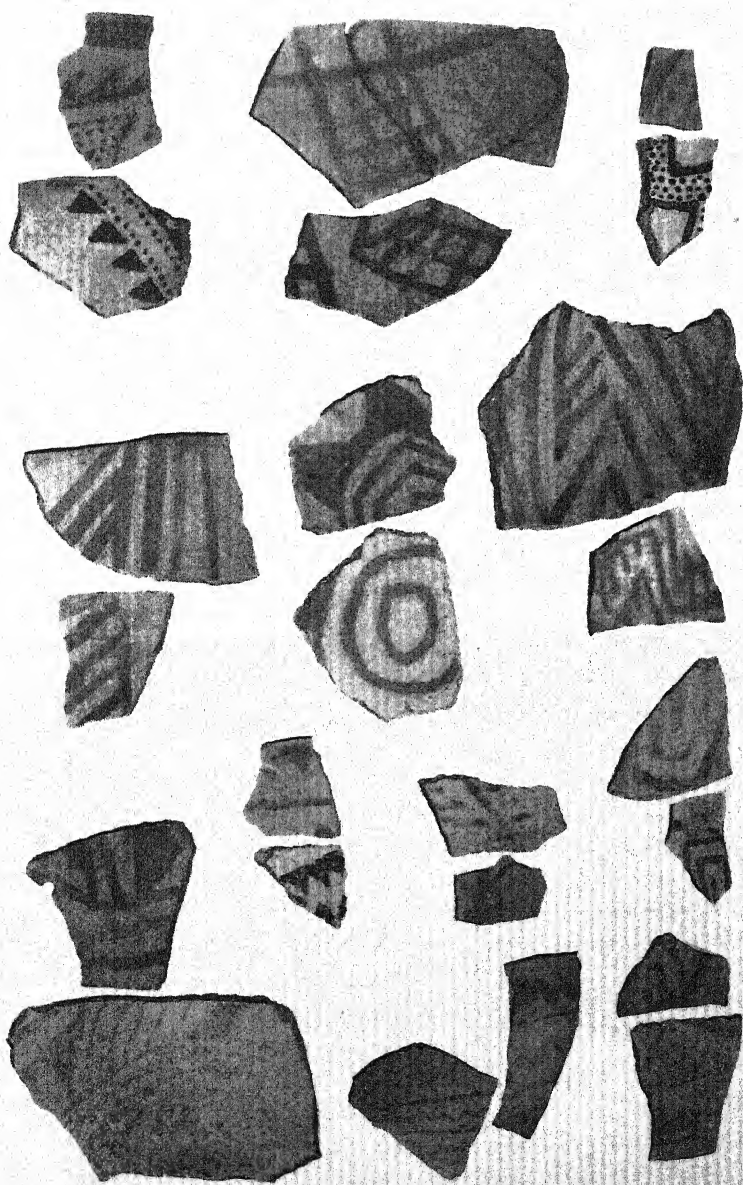


FIG. 137. Similarities of designs, Abajo red-on-orange and Lino black-on-gray. In each pair, the upper sherd is Abajo.

UNPAINTED POTTERY

(Figs. 138-143)

Three predominant kinds of unpainted pottery were recovered: Lino gray, Fugitive red, and Kana-a gray (banded neck) wares. Lino gray was found at both Sites 1 and 2; Fugitive red mostly at Site 2; and Kana-a gray at Site 1 (the more recent of the two villages) plus a few sherds from Site 2.

Fugitive red ware is often classified as Lino gray, although Colton and Hargrave (1937, p. 193) have catalogued it as a separate type. We do not feel sure that it is a separate type, but we desire to record our observations on this matter. Judging from the 148 sherds and the four whole specimens which we collected from the excavations, we have noticed that, by and large, the vessel walls of Fugitive red pottery are proportionately thicker than are the vessel walls of Lino gray; the temper seems to be much coarser in Fugitive red pottery than in Lino; and, most important of all, the mouths of the Fugitive red jars are probably twice as narrow (in proportion to the size of the jar) as the mouths of the Lino gray jars. Now, whether that is a valid excuse for setting Fugitive red pottery apart from Lino gray depends on future research. These differences are recorded for what they may be worth. We feel that it is merely a variation of Lino gray.

The shapes of the unpainted pottery may be listed as follows: jars, pitchers, bowls, and half-gourd ladles. The majority of Lino gray and Kana-a gray rims were from wide-mouthed jars with vertical necks and rims. A minority of Lino gray and a majority of Fugitive red rims were from narrow-mouthed jars with either vertical rims, or rims sloping at an angle towards the interior of the vessel. Another smaller minority of Lino gray rims were from jars in which the rims flared outward. The majority of Lino gray rims from bowls curved slightly inward. On both Lino gray and Kana-a gray vessels rounded lip surfaces predominated over squared lip surfaces.

Most of the Lino gray handles were loop handles, although almost as many of the strap type were found. Other forms of handles which occurred on Lino gray vessels were double loop handles, indented hand-holds, gourd tips, and various types of lugs. Some of these lugs are large and heavy. They probably served as handles. Others are small and pointed, flat and set vertically on the necks of vessels, or rounded and perforated knobs. These latter forms appear to have served for the attachment of string handles to vessels.

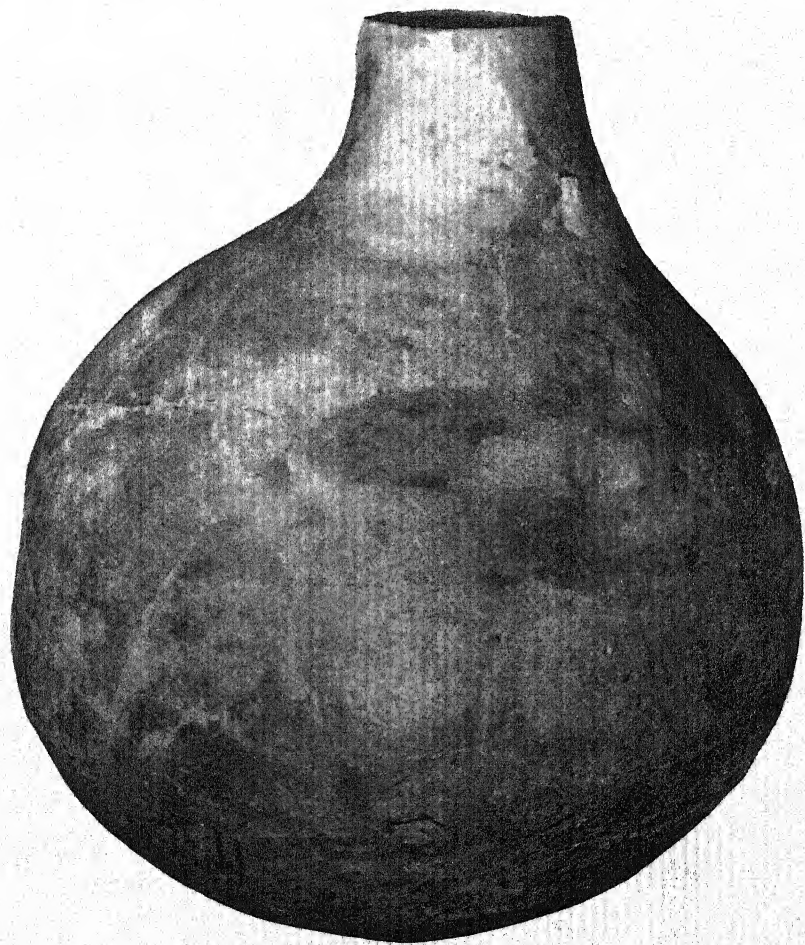


FIG. 138. Lino gray (Fugitive red) jar. Site 2. Scale 1:4.

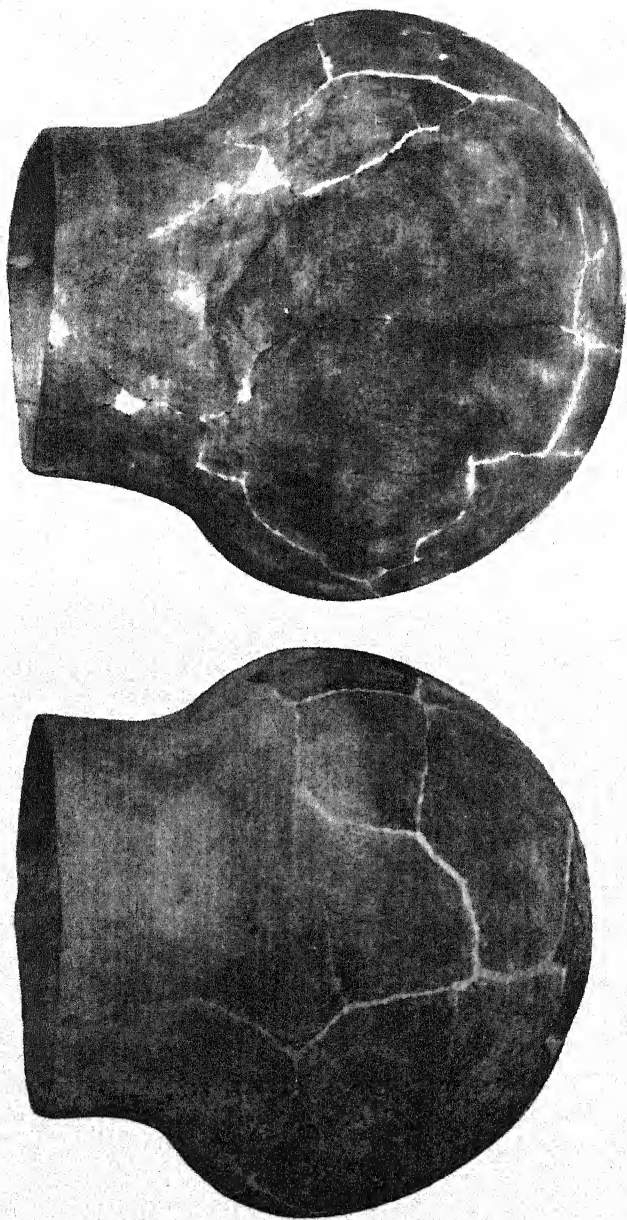


FIG. 139. Lino gray jars. Left, Site 2; right, Site 1. Scale 1:4.

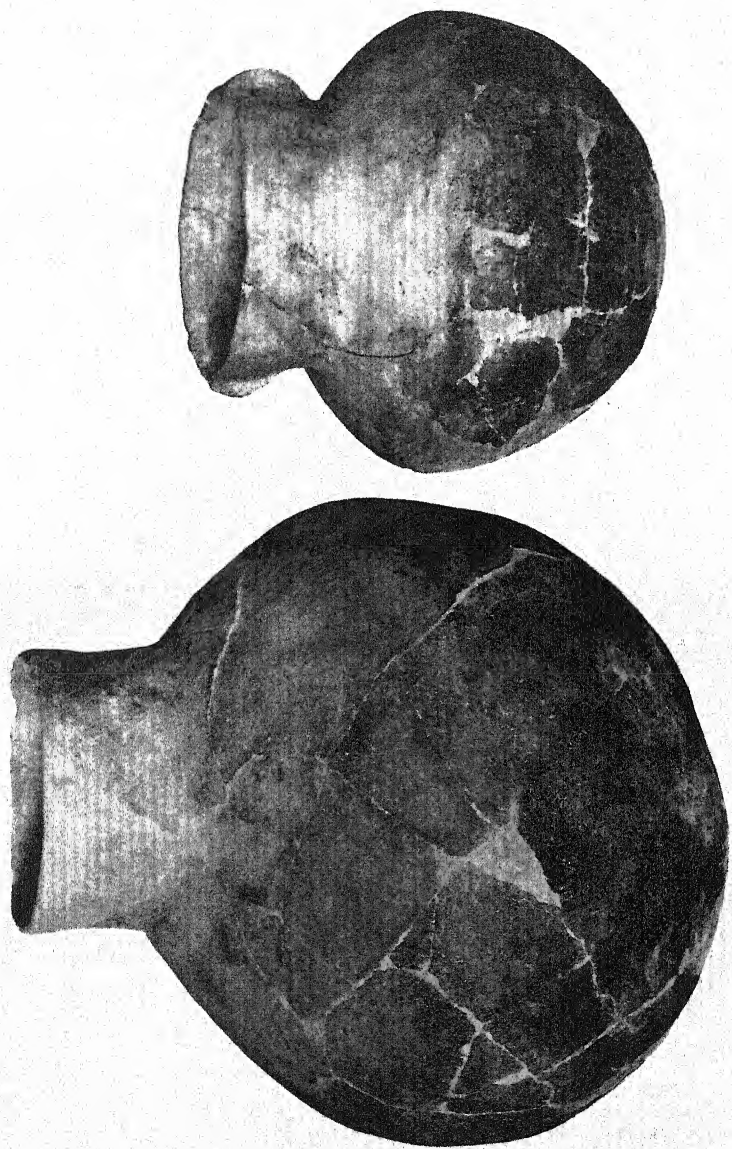


FIG. 140. Lino gray jars. Left, Site 2; right, Site 1. Scale 1:3.

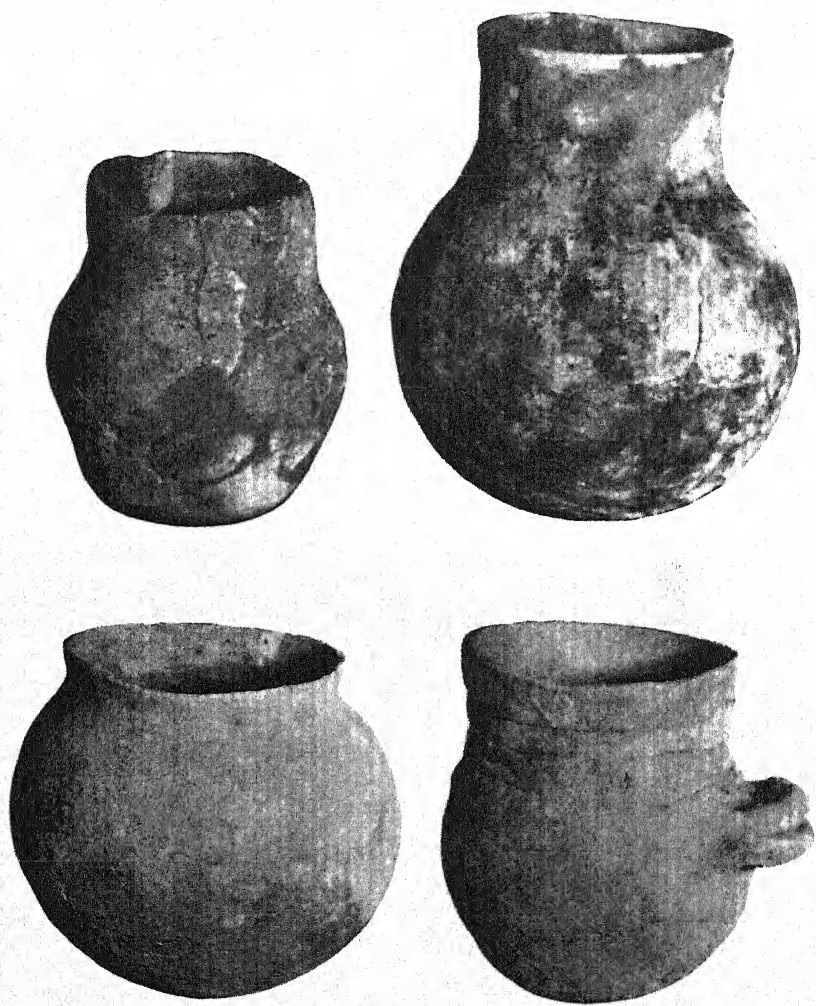


FIG. 141. Unpainted pottery jars. Lower left corner, Kana-a gray (Site 1); remainder, Lino gray (Site 2). Scale 1:2.

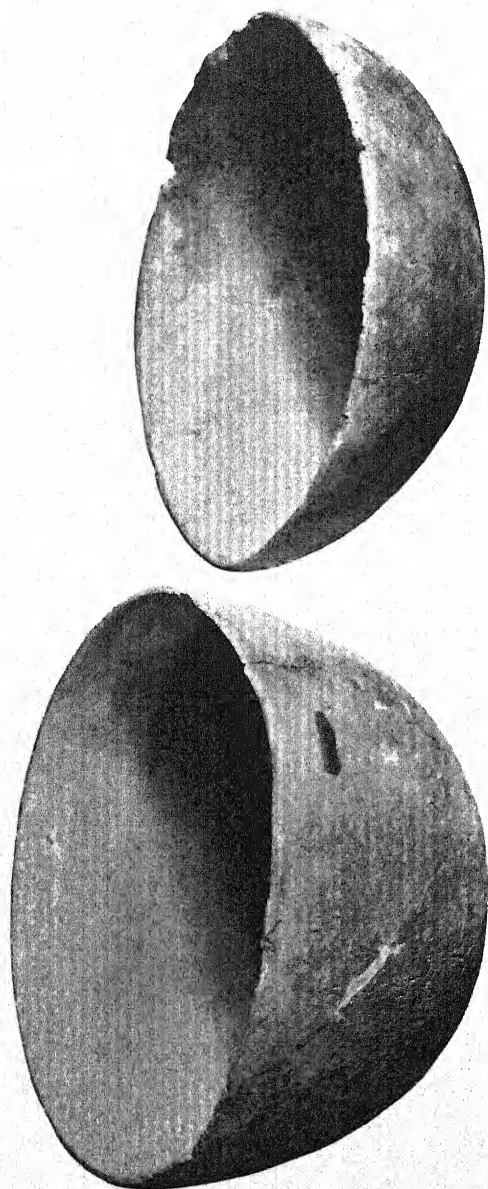


FIG. 142. Lino gray bowls, Site 2. Scale 1:2.

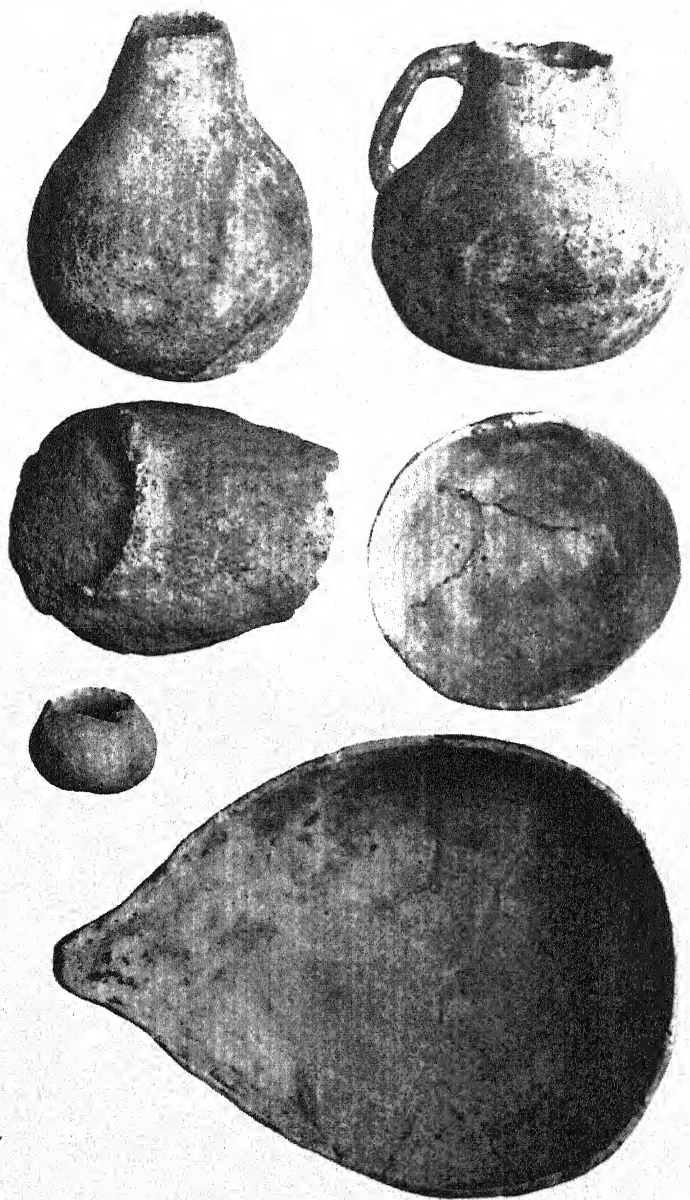


FIG. 143. Lino gray pottery. Upper two rows, Site 2; lower row, Site 1. Middle right, canteen (Fugitive red). Scale 1:2.

The bottoms of Lino gray vessels were round, flat, or concave. Flat and concave bottoms were in a minority.

Since, as in the case of the painted pottery, it was impossible to undertake a petrographic study of the unpainted pottery, I have indulged in no guesswork concerning the nature of the temper, hardness, and the like.

MISCELLANEOUS POTTERY TYPES

(Not classed as new types; probably aberrant forms)

"Pink" ware; *not* overfired Lino gray; thicker vessel walls in proportion to size; texture finer than in Lino gray. Fourteen sherds found, only at Site 1 (more recent site).

"Trailed" corrugated; similar to washboard corrugated (Martin, 1938, Plate CLXXVI) except that corrugations are horizontal. Eighteen sherds found, only at Site 2 (earlier site).

Lino incised; a plain gray Lino-like pottery with incised patterns of checkerboards, meanders, and imitations of banded necks. Four sherds found at Site 1.

Indeterminate orange; a pottery with an orange background, but no designs showing. Probably these sherds belonged either to vessels of Abajo red-on-orange or to La Plata black-on-orange pottery.

TRADE WARES(?)

Three large sherds from Site 1 (more recent site) have been classified as San Francisco red, a pottery of the Mogollon region. These sherds *look* like San Francisco red, but their identity is uncertain. From Site 2 came a few White Mound black-on-white sherds.

POTTERY DATA

The pottery was classified and counted, the results tabulated, and averages made for each level (20 cm. thick; see description of levels in Chapter II).

There was no significant variation of pottery types in any part of the sites. The comparison of pottery types, level by level, for surface houses, pit houses, and large kivas, likewise showed no important differences. The frequencies of wares were fairly constant and when plotted either by actual number of sherds or by percentages did not approach a normal frequency curve.

At Site 1, level by level, there was a constant and important association of Lino gray, Abajo red-on-orange, La Plata black-on-orange, Lino black-on-gray, and Kana-a gray wares.

At Site 2, level by level, there was a constant association of Lino gray, Abajo red-on-orange, and Lino black-on-gray. A few sherds (27 out of a total of nearly 15,000) of Kana-a gray were recovered from the west wing.

The chronological sequence or coevality of any of the surface rooms and the pit houses cannot be established. My guess is that the surface rooms and the pit houses at Site 1 were all built at about the same time and were used more or less contemporaneously and for only a short period of time. I would make the same guess for Site 2 (the older) except that I would add that perhaps the west wing is slightly later than the other two sections, because of the presence of a few banded-neck sherds (Kana-a gray). This is not conclusive evidence; it is merely suggestive, especially since I do not have tree-ring dates for all sections of the village.

The sherds in the pit houses of both sites, as shown by the soil profiles, had been washed in, except in Pit House D, Site 2. In the latter case, the pit house had been used as a dumping spot.

Only two sherds of La Plata black-on-orange ware were found at Site 2 (the earlier). However, both Abajo red-on-orange and La Plata black-on-orange were found associated at Site 1 (the later). Since the designs of the La Plata black-on-orange are for the most part the same as those on Abajo red-on-orange, and since it is known from tree-ring dates (see Chapter V, Synthesis) that Site 2 is earlier by about one hundred years than Site 1, it seems fair to conjecture that La Plata black-on-orange grew out of Abajo red-on-orange.

SUMMARY

A statistical study of the pottery types from Site 1 indicated no variations or periodic fluctuations. The same statement holds true for Site 2.

Therefore, all the sherds of one type from all levels within a site, including the levels in the pit houses, have been lumped together; and, to simplify matters, a bar graph (Fig. 144, p. 455) has been included, showing all pottery types in percentages for each site as a whole. To make this clearer let me take a typical example: all the sherds of Lino gray pottery from all levels from all trenches, pit houses, and surface houses at Site 1 have been added together, producing a total of 13,613 sherds, which is approximately 77 per cent of the total number of all kinds of sherds (17,674) found at Site 1.

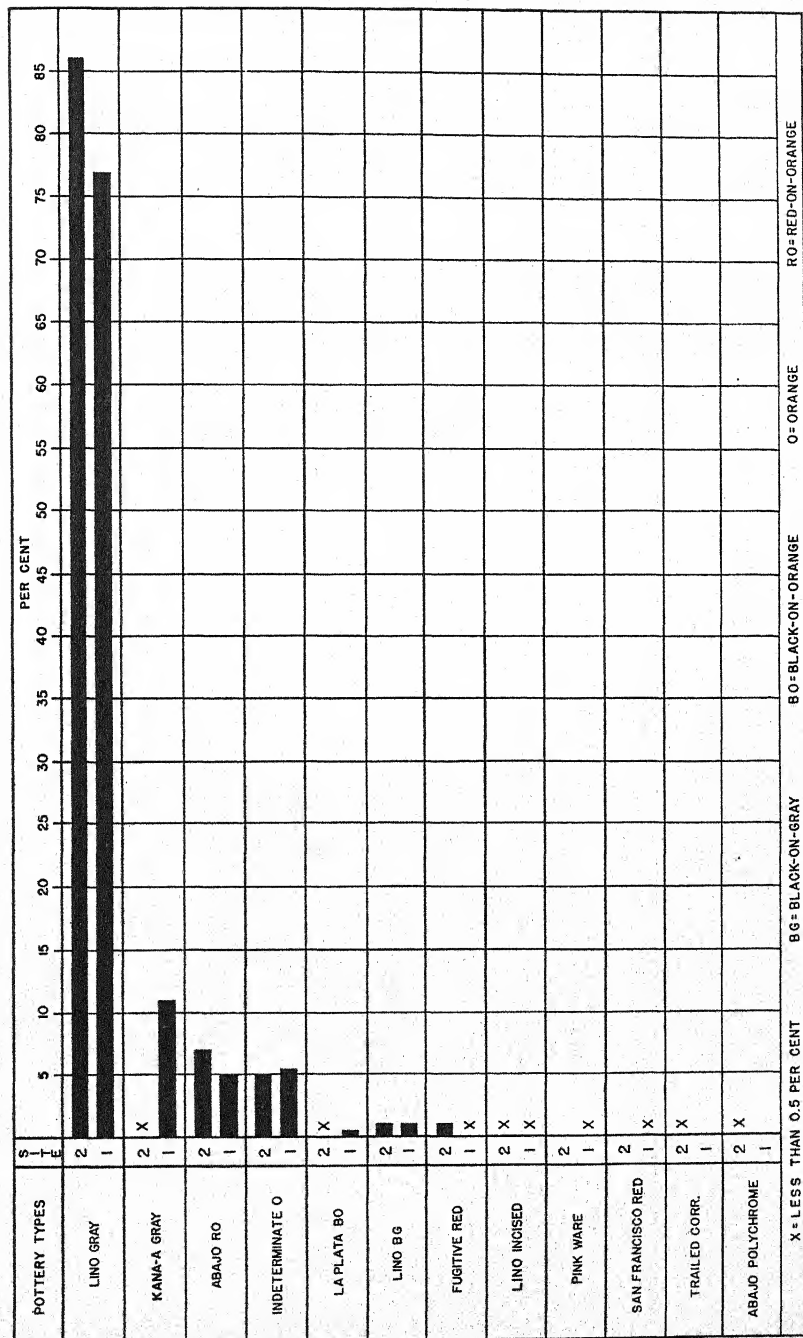


Fig. 144. Graph representing distribution (in percentages) of pottery types for both sites; sites arranged chronologically. X represents less than one-half of one per cent.

On the bar graph the sites are arranged as follows: Site 2 (the earlier, dating about A.D. 760) is first, with Site 1 (the more recent, dating about A.D. 860) following.

In addition, tables showing the number and approximate percentages of all sherds (by levels, if any exist) from all rooms, pit houses, trenches, and large kivas are given (see Appendix B, pp. 481-486). Furthermore, I have added a table summarizing all these data, by sites, in condensed form in order to show the figures used in constructing the graph on page 455 (Fig. 144).

The bar graph makes it evident that:

- (1) Lino gray was more abundant at the earlier site (Site 2).
- (2) Kana-a gray (banded-neck pottery) was not plentiful at either site, but was more important at Site 1 than at Site 2. Only twenty-seven sherds of it were recovered from Site 2 (out of a total of nearly 15,000).
- (3) Abajo red-on-orange was more frequent at Site 2 (the older).
- (4) La Plata black-on-orange was present to the extent of 1 per cent (71 sherds) at Site 1 (the more recent), while one whole vessel and two sherds of it were found at Site 2.
- (5) Lino black-on-gray (Basket Maker painted pottery) occurred at both sites with the same frequency.

A graph representing the distribution (in percentages) of design elements of Abajo red-on-orange and La Plata black-on-orange has been included. La Plata black-on-orange occurred only at Site 1 (with the exception of two pieces from Site 2), and as most of the designs (sixteen out of nineteen) are shared in common by both types of pottery, and since Site 1 was built and occupied about one hundred years later than Site 2, it is reasonable to consider the possibility that La Plata black-on-orange grew out of Abajo red-on-orange.

Likewise, by studying Figure 137, it may be seen that the designs on Abajo red-on-orange are similar to those on Lino black-on-gray. Our material is too scanty to permit us to make thorough comparisons on this subject of the relation of Lino black-on-gray and Abajo red-on-orange; but I suggest this possibility merely as a speculation.

The basket-handled bowl of La Plata black-on-orange ware from Site 2 is a unique shape for the Basket Maker period, so far as I know.

V. SYNTHESIS

SUMMARY

Two large ruins in the Ackmen-Lowry region of southwestern Colorado were partially excavated.

Site 1 consisted of three units of contiguous, one-story surface rooms (with masonry walls) built around three sides (north, east, and west) of a large square. In the plaza thus formed were located the pit houses and the lesser Great Kiva. The larger Great Kiva lay about 200 meters farther south. We excavated fourteen surface rooms, three pit houses (and portions of two more) and the two large kivas, about one-twelfth of the site.

Both the front and the rear rows of rooms at Site 1 were provided with walls of crude masonry. The front row (row nearer the plaza) contained firepits (also ventilators in some cases), storage cists, and pottery. The rear row contained much charred corn and many metates, but no firepits.

The dates of Site 1 obtained from the charred roof-beams of the pit houses range from A.D. 855 to A.D. 872, according to the careful study of Mr. Harry T. Getty (see Appendix D).

The predominant pottery types were Lino gray, Kana-a gray (banded-neck pottery), Abajo red-on-orange, and La Plata black-on-orange.

Site 2 (the older village), the axis of which lay east and west, consisted of a double row of contiguous one-story surface rooms and of pit houses lying south of the surface rooms. At this site we excavated sixty-one surface rooms and eight pit houses, about one-half of the site. This village had been built in three sections—an east, a central (which was curved), and a west.

The front or south row of rooms at Site 2 had been provided with walls of upright posts set from 15 to 70 cm. apart. The interstices thus formed had been plugged with mud, forming a solid wall. This type of construction is sometimes known as *jacal*. Each of these rooms contained firepits, storage cists, and pottery. The rear row of rooms had been provided with walls of upright slabs topped by rubble. The total height of these walls (rubble on rock-and-slab foundation) was probably about 2 meters. These rubble-on-slab-walled rooms contained quantities of charred corn and some metates, but no firepits.

The dates of Site 2 (released by Mr. Harry T. Getty) range from A.D. 747+x to 768+x.

The predominant pottery types at Site 2 were Lino gray and Abajo red-on-orange.

Concerning the stone and bone artifacts the following general statements may be made:

The same types of stone artifacts were found at both sites. It is interesting to note, however, that more stone tools used for grinding purposes were found at Site 1 (the younger site), while more bone tools were recovered from Site 2 (the older). The only stone artifacts possessing characteristics which distinguish them from artifacts of the Pueblo I and II periods are projectile points, axes, manos, and metates.

Both sites yielded the same types of bone artifacts; and these types are the same as those recovered from Pueblo I and II villages.

CONCLUSIONS

The title of this report makes evident my belief that both of these sites belong in what is known as the Basket Maker period. I think it is quite proper to assign them to a period and cultural status, so that all may know my opinion. As both sites were essentially similar, such differences as existed (as, for example, the presence of masonry in the later village) were not important enough to call one Basket Maker and the other Pueblo.

Permit me to point out their likenesses. Both villages were large, each possessing some 80 to 150 contiguous surface rooms and each provided with ten to fifteen pit houses. The arrangement of the rooms at both sites is the same; that is, the front row, or the row nearer the pit houses, possessed firepits and whole pieces of pottery, and the rear row of rooms contained charred corn and no firepits. Mr. J. O. Brew reports a similar arrangement of rooms in a site at Alkali Ridge, Utah, and is of the opinion that the front row of rooms was used as living quarters, and the rear row, as storage rooms. I agree with his conjecture. I should guess that pit houses were used both for domestic and ceremonial purposes.

The main axis of the superficial rooms at both villages is east and west. The earlier site has a curved section of rooms extending southward; the later site, two short right-angled wings extending south from the main axis. It should be pointed out that the east-west arrangement of rooms with kivas to the south was the usual arrangement in the later Pueblo II and III villages.

The pit houses at both sites are similar so far as shape, method of roofing, and southern antechambers are concerned.

The predominant pottery types at both sites were Lino gray and Abajo red-on-orange.

At the later or more recent site, Kana-a gray (i.e. banded neck) and La Plata black-on-orange wares were found in very small quantities. I believe that La Plata black-on-orange is merely a later variant or development out of Abajo red-on-orange. The designs on both kinds of pottery are the same. One per cent of the pottery from Site 1 as well as from Site 2 was Lino black-on-gray (i.e. Basket Maker painted pottery), while Lino gray constituted about 90 per cent of all the pottery found at both sites. These percentages are based on a count of 30,000 sherds. Lino black-on-gray, therefore, was unimportant.

Archaeologists generally consider the association of such traits as crude masonry and banded-neck pottery as diagnostic of the Pueblo I period. On the other hand, our intensive survey work and extensive excavations in southwestern Colorado for the past ten years have revealed other more significant criteria for distinguishing between Basket Maker and Pueblo periods.

For example, we found that Basket Maker sites consist of large villages of 100 or more, contiguous rooms with walls either of slabs topped by rubble, upright posts and adobe, or extremely crude coursed masonry; a proportionate number of pit houses with southern antechamber-entryways; and large circular structures, the probable prototypes of the later Great Kivas. The main axis of the villages is east and west, with pit houses to the south. Pottery is mainly Lino gray (90 per cent) and Abajo red-on-orange (6 per cent). Naturally, I should consider a large site having some crude masonry walls and some banded-neck pottery as slightly later than one having only slab-walled rooms and Lino gray pottery. But I should still call both sites Basket Maker. The tree-ring dates show that Site 1, the village with surface rooms and masonry walls, was about one hundred years later than Site 2, the village with the slab- and *jacal*-walled rooms.

Our researches further showed that the Pueblo I period was ushered in by the introduction into that region of black-on-white and indented corrugated pottery. With the advent of these two new pottery types, although Lino gray and Abajo red-on-orange were still made and used, the villages were tremendously reduced in size

from the large ones I have described to tiny, one- or two-roomed affairs with a single pit house.

This conception of the Pueblo I villages may be clearer to you if I put it this way: If you could cut off one slab room, one *jacal* room and one pit house from either of the large Basket Maker villages which I have briefly characterized, place on the floors of these rooms Mancos black-on-white, indented corrugated, Lino gray and Abajo red-on-orange pottery and set this whole complex off by itself, you would then have a Pueblo I village of southwestern Colorado. At about this time, large kivas temporarily went out of style.

I should conjecture that with this breakdown of large villages into small ones and with the introduction of new pottery types, the social organization and general culture underwent profound changes.

I need not describe in detail the characteristics of the periods which followed, except to point out that by Pueblo II times one finds that villages again consist of eight or ten contiguous rooms running east and west, with kivas (the offspring of pit houses) to the south. The villages of Pueblo III times are merely enlarged versions of the Pueblo II villages; but the seeds which contained the Pueblo cultural traits were already sown in Basket Maker times and came to fruition many centuries later.

As a consequence of ten years of work in southwestern Colorado, we know that no gap between the Basket Maker and Pueblo I periods really exists. We have all the links in the prehistory of southwestern Colorado. Furthermore, our work of last summer supports all the evidence gathered in 1937.

It might be useful, therefore, to outline the major and distinguishing characteristics of the various culture periods for southwestern Colorado as established by our intensive archaeological researches (digging and archaeological survey, i.e. explorations). It should be borne in mind that this historical reconstruction is only supposed to hold true for the Ackmen-Lowry area of southwestern Colorado and perhaps for adjacent territory. This outline is for the general reader.

MODIFIED BASKET MAKER PERIOD (BASKET MAKER III)

(About A.D. 700-860; from tree-ring dates)

The villages were large, having from 75 to 150 contiguous surface rooms and perhaps ten or fifteen pit houses.

The people of this period constructed rooms of three kinds in the open. I shall describe these briefly.

(1) Rooms, the floors of which were a few inches below the ground surface and the walls of which consisted of upright slabs which supported rubble walls of small stones set in abundant mortar. These rooms were contiguous. Each of these slab-walled rooms was roofed by means of four upright posts, one set in each corner of the room. It is assumed that these upright posts were forked, thus providing a rest for the main roof-beams. Presumably on these larger beams smaller ones were laid and on top of the latter, bark and mud. The exact use of these rooms is not known, but it seems probable that they were used as granaries and general store rooms.

(2) Rooms, built contiguously, the walls of which were of upright poles (set stockade-fashion) and mud. The spaces between the posts were plugged with mud into which leaves, grass, and reeds were worked as binder. These houses were roofed by means of poles, bark, and mud, all supported by means of forked upright posts (evidence from burned, well-preserved rooms). In each of these rooms was at least one firepit and sometimes two; and in many of the rooms were large cists or storage pits, sunk in the floor. These rooms varied in size, but on the average each one measured about six by eight feet. I do not know how such rooms were used; my guess is that they may have been living quarters.

(3) Pit houses (so-called because they are in reality large pits), the floors of which were six or seven feet below the ground level. These pit houses were not all the same size, but most of them were about fifteen feet square. The later ones are generally more roundish. Entrance to a pit house was by means of a small antechamber (to the south) which was connected to the house proper by means of a short passageway and a door in the south wall of the house. Near the center of the room, in the floor, was a firepit. An east-west partition wall divided the room into a larger space to the north and a smaller space to the south. The roof, which was composed of logs, was supported by four large posts, the upper ends of which were probably forked, thus providing a rest for the main stringers. In the floor, and without any seeming arrangement, were numerous holes, large and small, deep and shallow. The use of these is unknown; some of them may have served as pot-rests and one (north of the firepit and nearest to it) may have been analogous to the sipapu, which is found in modern kivas.

Whether these underground houses were used only as living quarters (in addition to the above-ground pole-wall houses) or only for celebrating ceremonies or for both purposes is not known. Be-

cause corn-grinding stones (metates and manos), cooking pots, and stone tools have been found on the floors of all of them, I should guess that they were certainly used as living quarters. It is also probable that these pit houses served as places in which to hold ceremonies. Just why two kinds of living quarters (above-ground pole-wall houses and pit houses) existed simultaneously is difficult to explain.

The arrangement of these various kinds of rooms was as follows: a row of slab-walled rooms running east and west; to the south of them, a row of pole-and-mud-wall rooms; to the south of this double row of above-ground rooms, the pit houses. It is interesting to note that this sort of arrangement held on through to late Pueblo times.

The pottery used by the people of this period was of three kinds: (1) a plain, undecorated smooth pottery with all coil marks obliterated (Lino gray); (2) a pottery with an orange background and red or black designs (Abajo red-on-orange); and (3) a small quantity of a gray pottery with black designs (Lino black-on-gray).

The stone and bone tools of this period were abundant. Since it is unnecessary to go into technical details and differences in this place, suffice it to say that the stone tools consisted of troughed stone metates with only one end of the trough open, manos, axes, rubbing stones, hammer stones, mauls, polishing pebbles, projectile points, drills, knives, and scrapers. A few of these tools have distinguishing marks or characteristics which set them apart from those of later periods. The tools made of animal bones consisted of awls, scrapers, and needles.

Corn and possibly squash were grown and used for food.

Some time about the year A.D. 800, the character of the houses changed. Pit houses were still fashionable, but the method of roofing them was slightly different. Instead of four main upright supports, many small poles were used. These, numbering as many as forty, were set around the periphery of the room. The above-ground rooms were no longer constructed of slabs and poles and mud, but were provided with crude, coursed masonry walls. But the general arrangement of the village was the same as in earlier times, since these rooms were contiguous and were built in double rows, and since the rear row of rooms was used for storage (these would correspond to earlier slab-walled granaries) and the front row, for living quarters (these would be similar in function to pole-and-mud-wall houses of earlier times). All the rooms used for living quarters were provided with firepits and some of them with small ventilator shafts and deflectors. At this time large circular structures (dance plazas? and

prototypes of later Great Kivas?) became popular. At one village we found two, one measuring 82 feet in diameter and another 43 feet. These are as large as any of those found for later times. The pottery was practically the same as that of the preceding period except that the necks of some of the gray cooking vessels were "banded"; that is, the coils from which the pottery was constructed were obliterated on the body of the vessel but were not obliterated on the neck. La Plata black-on-orange also appears at this time.

The stone and bone artifacts for these late Basket Maker houses were the same as described above.

DEVELOPMENTAL PUEBLO

A. PUEBLO I PERIOD

(About A.D. 860-950; estimated)

Some time about the year 860, the Basket Maker culture was modified considerably. The modification may have been wrought either by the incoming of new settlers or by different cultural influences or by both. Whatever the factors were, the change is apparent. In the first place, large villages of many contiguous rooms were no longer built. There was a complete breakdown of this sort of arrangement, and instead we find many sites consisting of but one or two above-ground rooms and a single pit house. The walls of the above-ground rooms were either of slabs which supported rubble walls or of upright poles and mud. The pit houses were the same as those of the preceding period with a few minor differences.

The pottery was markedly different from that of the Basket Maker period, since new types were mixed with the old ones. In addition to the plain gray pottery, with and without banded necks, the black-on-gray pottery, and the red-on-orange pottery, we find in these small Pueblo I sites several kinds of indented corrugated pottery which was used for cooking purposes, and black-on-white pottery (Mancos black-on-white).

This black-on-white pottery was probably introduced from the south (near what is now known as Gallup, New Mexico) either by trade or by actual migration of tribes from the south into southwestern Colorado. The designs on this pottery resemble those found on pottery from Chaco Canyon, New Mexico, and adjacent territory.

The metates and manos, axes, rubbing stones, hammer stones, mauls, chipped artifacts, and bone tools were more or less similar to those of the Basket Maker period. Slight differences exist, but technical minutiae are out of place here.

Corn, beans, and squash were the main food crops.

B. PUEBLO II PERIOD

(About A.D. 950-1050; partly estimated, partly from tree-ring dates)

The cultural period known as Pueblo II was a direct outgrowth of the Pueblo I period. At the beginning of Pueblo II times it is difficult (except for a specialist) to spot the differences between Pueblo I and II; but by the time the Pueblo II culture is well under way, the differences are pronounced.

Masonry (walls built of stone laid horizontally) which was first noted in the late Basket Maker period, is now exclusively used for house and kiva walls. Surface rooms, in groups ranging from four to ten, were somewhat larger than the slab-walled rooms, and, although well built, were but one story in height. The circular underground chambers, called pit houses in the former periods and used at least partially for living quarters, were, in Pueblo II times, probably exclusively used as places for celebrating ceremonies. The southern antechamber no longer served both as a place of entrance and as a fresh air duct, but was smaller and now served merely to introduce fresh air into the chamber. In other words, the people of this period lived above ground entirely. Each village was provided with two kivas. But the general arrangement of the rooms, kivas, and refuse heaps was exactly the same as that of the Basket Maker period; namely, a row of four to ten rooms, contiguously built, the axis of which was east and west; the kivas (corresponding to the old pit houses), to the south of the living quarters; and the refuse heaps, to the south of the kivas. Thus, it is clear that the people of this period are again living in larger villages, as in Basket Maker times.

The pottery of this period consists now entirely of a good black-on-white pottery (Mancos black-on-white) and several kinds of indented corrugated cooking wares. The older plain gray (Lino), black-on-gray (Lino black-on-gray), and red-on-orange (Abajo red-on-orange) have completely disappeared. A few new shapes were introduced—notably mugs, canteen-shaped vessels, jars with lids, and ladles with tubular handles.

Towards the end of the period, the black-on-white pottery became better made and better decorated. The characteristic designs used on the later, Classic Mesa Verde pottery, developed during this time.

The metates were troughed, but instead of having one end of the trough closed, both ends were open. Other stone artifacts, such as axes, mauls, hammer stones, and bone implements, were much the same as in Pueblo I. Differences do exist, it is true, but the

reader interested in these may consult the references cited in the bibliography.

GREAT PUEBLO (PUEBLO III)

(About A.D. 1050-1275; partly estimated, partly from tree-ring dates)

It is difficult to draw a line between late Pueblo II and early Pueblo III but about A.D. 1100 enough new cultural elements were added to the older features so that it is possible to recognize a marked change in the total culture complex. This we label Pueblo III, the Great Pueblo period. It was during this time that pottery, architecture, weaving, stone and bone tools, and basketry reached their highest development in this area.

The small houses of eight or ten rooms of Pueblo II times were gradually enlarged to accommodate the increased population. Agricultural methods were improving, and bigger crops made it possible for a larger number of people to live off a certain area of cultivated land. The people began to group their houses together into larger and larger clusters so that towns came into existence. These towns or villages consisted of large community houses from two to four stories in height and possessing many kivas or ceremonial rooms. Such towns were generally built in the open.

Lowry Pueblo, excavated by Field Museum, is an example of this type of village. It started as a very small cluster of a few rooms and a kiva. From time to time over a period of fifty years, additions were made until it finally consisted of about twenty-five ground-floor rooms all of which had several super-imposed stories. The total number of rooms may have been about one hundred.

This particular pueblo was unique in this region for the reason that it possessed a Great Kiva. If the small kivas were likened to chapels or churches, the Great Kiva would correspond to a cathedral. There are relatively few Great Kivas known, and the presence of one at Lowry Pueblo may have been the reason for its further development, growth, and long occupation.

The pottery of this period was well made and was not only the best but also the last that was ever produced in southwestern Colorado. It consisted of a beautiful, skillfully decorated black-on-white pottery with a glossy, clear polish; some red pottery decorated with black paint; and cooking vessels with delicate indented corrugations over the entire exterior.

The pottery, masonry, types of kivas, and the Great Kiva are all traits which are similar to or identical with those found in north-

western New Mexico; namely, around Gallup and Chaco Canyon and the adjacent territory. It seems probable that these Chacoan traits which first came into the Lowry-Ackmen region in Pueblo I times and apparently kept on increasing in intensity, came from the regions just mentioned.

But about A.D. 1150 the great pueblos or towns built out in the open, with no defense systems, were abandoned forever. Why did this happen? Probably all the villages of this area were deserted because of fierce, marauding nomadic tribes which began to invade this territory. These plundering nomads may have been the ancestors of the modern Apache and Navaho Indians. They were hunters as opposed to the farming Pueblo Indians, and they wandered around in search of new hunting grounds. These invaders found it easy to capture the undefended Pueblo villages. So far as we know, they never inhabited the towns but merely absconded with the women and children and the large stores of corn, beans, and squash.

The Pueblo Indians were forced to flee before these ever-increasing hordes of pillagers and to seek the large natural caves as safe places to live. Here they remained until about A.D. 1276, at which time or soon after, they were forced again to leave the region. This time the hegira was necessary because of a long drought, during which time it would have been difficult if not impossible to raise crops.

I have tried to show that in the Ackmen-Lowry area of southwestern Colorado, four cultural periods existed. The earliest was "Modified Basket Maker." This dates around A.D. 700. About the year 860 or soon after, for some unknown reason or reasons, the conservative Basket Makers began to adopt new ideas from the south (now known as New Mexico). Changes, which were radical for them, came about in pottery-making, house-building, and tool-shaping, and thus a new period (Pueblo I) came into being. It should be made clear that the people who lived here between the years 860 and 900 were probably as unconscious of this change in their culture as our parents were when they left the Victorian era behind them and entered the modern. I have emphasized the differences between the Basket Maker and Pueblo I periods because of the breakdown of large villages into small ones and the introduction of radically different pottery types.

After these violent changes, the culture of the area slowly progressed with no very marked changes between periods until finally the people withdrew from this region. The development, once started, was along the same general lines and there were no great upheavals

between any of the Pueblo periods as there were between those of the Basket Maker and Pueblo I times.

CONJECTURES

Everyone is aware of the fact that it is impossible to explain and to give absolute meaning to all the discoveries which are made while digging ancient villages. All we can do is to interpret what we find in the light of our knowledge of modern Pueblo (Southwestern) Indians. In this way, it is possible to moderate our conjectures, and piece them together by means of reasonable imagination. Thus, the cold, unrelated and often dull archaeological facts are vivified and the reader may have some sort of reconstruction in his mind's eye of what the Basket Maker Indians were like and how they lived. It is often difficult for the professional archaeologist to remember, as he uncovers room after room and cleans out from pit houses the accumulated trash of twelve centuries, that these structures were once occupied by people very much like the folk of today. These rooms were once homes and the families who lived in them probably were alternately blessed with joys and cursed with sorrows, had periods of worrying and rejoicing, just as families of today.

I have no doubt that a hunter who had tramped all day through the snow and up and down canyons in quest of meat for his family, regarded his home as a warm, familiar, and welcome spot, and that he gratefully and joyfully looked forward to returning there at the end of the day. These homes were the rooms which we were digging out, measuring, photographing, and describing. It is easy for those of us who are professional archaeologists to become so immersed in fact-finding and recording minutiae that we forget that we should not undertake this work in order to record such minutiae. We should rather seek to discover as best we can how the peoples of the past lived and worked, how they grouped themselves socially, how they solved their economic problems and their "depressions"—raids, droughts, pests. In this way we enrich our knowledge, learn from the past, and make available the facts of prehistory in order to satisfy a psychologically unexplained, but very healthy curiosity about the past. By accumulating facts and interpreting them we are able to judge as to the real meaning of the development of mankind and the origins of the fundamental events of history. Likewise, if we realize that the ancient peoples whose houses and tools we investigate were, after all, *people*, very much like ourselves, we obtain a warm, close, and necessary affiliation with the past and we see that we are merely

a part of the continuity of life and that there is a continuum of culture. This discovery both humbles and stimulates us because we realize that today's problems, though more complex, are not radically different from those which were encountered and had to be conquered by others.

Our excavations of 1938 in Basket Maker villages made it apparent that these villages were composed of two kinds of dwellings: surface rooms and underground quarters, both of which, so far as we could ascertain, were used simultaneously.

This association of two kinds of rooms is peculiar to Basket Maker villages. In earlier periods, pit houses predominated; in later periods, everyone lived in dwellings which were entirely above the ground and the subterranean places were probably reserved for ceremonial use and for men's clubhouses. But in the pit houses which we excavated we discovered the same kinds of tools and pottery and other household artifacts as in the surface rooms. In other words, it seemed that the pit houses as well as the surface rooms were occupied at the same time and used as domiciles. How could this be explained?

As I mulled over the problem last summer while preparing to write this report, I guessed at first that the pit houses were used sometimes for celebrating ceremonies. This guess seemed reasonable because all modern Pueblo Indians possess rituals which are performed in special places. Then, if the pit houses were used ceremonially at certain times, it might be fair to assume that the women would be excluded from portions of the ceremonies as they are in modern pueblos. If this were true, the women might have utilized the above-ground pole-wall houses during these ceremonial occasions, while during ceremonies the men had exclusive right to the pit houses. It also occurred to me that the surface rooms were used in summer by both men and women and the pit houses in the winter.

But these guesses were unsatisfactory because they did not fit all the facts. For example, there were so many more surface rooms than pit houses that it would not be possible for all the families of one village to live in the relatively few pit houses. Therefore, I consulted with Dr. Fred Eggan, Instructor of Anthropology, University of Chicago, who has made a study of modern Pueblo Indians and who, in the light of his experiences and study of modern South-western culture, was in a better position to interpret what we found. From our conversations, the following conjectures about the relationship of pit houses to surface rooms developed. It should be made

clear that these conjectures cover a larger span of time than was embraced by the life of the villages themselves; that is, our conjectures are concerned with the history of that area before A.D. 700 and after A.D. 900. We assume that the only early Basket Maker house was the pit house.

It is probable that the rituals of those early times were family affairs and were carried out in the household (in the pit house) by the male head of the family.

Then, surface, communal houses (rooms built contiguously) appeared. These may have been introduced from some other area (either in or outside of the Southwest) or may have been hit upon by the inhabitants of the region with which we are concerned. At any rate, these surface, communal houses brought families together in closer spatial relationships, which resulted in larger social groups.

At this juncture, both surface and pit houses existed in one village and both were probably used at the same time; that is, some families would have clung to the older type of dwelling (the pit house) and other families would have lived in the newer type of house, the surface type.

We can assume from what we know of primitive peoples generally, that certain conservative members of the community, especially those who were concerned with rituals, would have preferred to live and carry on rituals in the pit houses. It is probable that certain groups of people living in certain blocks of rooms were related (by blood or marriage or rituals) to people occupying the nearest pit houses. For example, at Site 2, the people living in the west unit of surface rooms might have been related to individuals living in Pit Houses D, G, and H.

Then, for some reason, the people in the pit houses moved out of their subterranean quarters into surface houses, but the pit houses were maintained and were used on ritualistic occasions.

Likewise, the traditional, homely, household objects were retained in the pit houses, perhaps because ceremonies were associated with these objects. The rituals by this time were probably participated in by men of a community or by men from segments of the community, rather than by single households, and the pit house (now really a "kiva," by definition a subterranean ceremonial room, rather than "pit house") also served as a kind of men's clubhouse and place for lounging—a natural development if one remembers that kivas were also probably the places for training individuals to carry

on rituals and that some lounging and loafing about would inevitably attend such drills.

I should also like to suggest that surface houses may have developed after pit houses because the former are technically harder to construct.

As for the two kinds of surface rooms (at Site 2) it might be conjectured that slab-walled rooms would protect surplus corn (a very important consideration) better than any other kind of enclosure; and that the pole-wall-and-plaster rooms might have been more comfortable for general living quarters.

Partition walls—that is, low mud-and-slab walls which divided the pit house into two unequal parts, the north or the larger one, and the south—were encountered in every pit house. The significance of these walls is not known, but one can not fail to be impressed by them because they occur with such regularity. A possible explanation may be derived by a study of modern Hopi Indian kivas. In these modern kivas, there is a secular as well as a sacred end, the latter being the place (usually the north side) where the ceremonies are celebrated. Such a division might be explained by assuming that it reflects an ancient partition of the household for various functions or duties.

The women's part of the pit house (in ancient times) might have been the southern portion (south of the partition wall) and the place for keeping the corn mills, pots, and other necessary household equipment. The cooking, however, must have been done at the central fire, which served for cooking, heating, and lighting.

This arrangement—the southern part of the pit house belonging to the women—corresponds more closely to the interiors of modern Hopi kivas, which are provided with a slightly raised southern portion reserved for female spectators of ceremonies, and a bench (which is sometimes found in ancient pit houses and generally in later kivas) around the "sacred" portion. It should perhaps here be pointed out again that most southwestern archaeologists are convinced that kivas are merely specialized pit houses, and that kivas developed from pit houses.

In some of the pit houses which we uncovered, we found in the floor (in addition to the central firepit) other depressions or pits comparable in size to the firepits. These we generally labeled "cists," but it is quite possible that they may have served for offerings or as special firepits, used only on certain ritualistic occasions; and, when not in use, they might have been filled with sand or earth.

The very large circular structures, which we called "Great Kivas" at Site 1 are interesting and worthy of consideration. As stated in Chapter II, these were probably not roofed. It is possible that such large circular enclosures were introduced as a new feature along with coursed masonry and new pottery types and were perhaps used for public ritual performances and communal dances, having therefore a different historical origin.

Although these Great Kivas do not offer much evidence for the assumption that they developed from pit houses, yet by examining two large circular structures, one, in southwestern Colorado, excavated by Mr. Earl Morris and not yet described in print, and one excavated by Dr. Frank H. H. Roberts (1929, pp. 73-81), both structures belonging to the late Basket Maker period, it is possible to make a fairly good case for such a development. In both of these structures one finds four centrally located roof supports, a firepit, a deflector, and a bench. These four salient features are certainly characteristic of many pit houses. Therefore, it is possible to assume that when the communities grew to sizeable proportions and the ceremonies were participated in by the whole community, it was necessary to construct what were, in essence, large "pit houses"—places where all the village might take part in certain bits of the rituals which, in earlier days, were held in the individual (and comparatively small) pit houses. In other words, the ceremonies outgrew the humble pit house and had to be transferred to a larger structure, which might be described as an "overgrown pit house." This might account for the origin of Great Kivas. Of course, the Great Kivas later became more complex and resembled less and less their relatively simple progenitors. Naturally, in Pueblo I times, as described above in the "Summary," Great Kivas or large ritualistic structures were not necessary because the villages became so tiny, consisting, as they did, of units of one or possibly two families. But the Great Kiva tradition may never have been completely forgotten and when the villages again became large, some of them constructed large round structures for celebrating community ceremonies.

In my report on the excavations of 1937 (Martin, 1938, pp. 295-300) certain conjectures were made concerning the stability, change, breakdown, and reorganization of culture. It was suggested that trends within the culture investigated tended to be cyclical and that certain combinations of characters within them moved from a stable status through a time of transition back to a stable status. A stable phase, or combination of characters, may be defined as one which is

represented by many sites, all of which share identical association of particular artifacts and traits, such as types of pottery and architecture. Moreover, stability, or uniformity of material culture, tends to be associated with the size of a village, i.e., a large village would be a stable one.

A less stable phase is one which is represented by fewer sites and by different and varying associations. Furthermore, it was assumed that a village which could be defined as belonging to a stable phase, as expressed above, would probably have been inhabited by a people enjoying the stable status of a folk-culture—ideally, a homogeneous society which has recourse to a fixed traditional pattern when problems arise, and which shows a tendency towards rigidity, doing things in a prescribed way. Thus, in a stable culture, there is only one way to build a socially acceptable house, and there are but two or three kinds of pottery which are “good.”

In addition, we conjectured that one could infer a variation in culture from typological variations in artifacts and architecture.

On the basis of these conjectures, I should not hesitate, then, to classify Site 2, the older one, as belonging to a stable phase. The people who inhabited this village partook of a rigid, tranquil, relatively inflexible mode of existence. They all built their surface and subterranean houses in the same way and all made and used the same kinds of pottery. Incidentally, a village which was stable is easier for the archaeologist to excavate, because once the pattern of the architecture is worked out—and this can be done usually from two or three rooms—the excavations can proceed apace because one always knows what to look for and how to dig.

Site I, the younger site, I should also classify as representing a stable phase, although not quite so tranquil and stabilized as Site 2. Site 1 partakes of more, rather than less, stable characteristics, but I have the feeling that it was verging on a transitional stage. The ground plan and the architectural arrangements were similar to those of Site 2, but masonry had been substituted for poles and slabs, two new pottery types had appeared, and Great Kivas had come into existence.

Thus, combining our work of last summer with all that we have done in the past ten years, we are able to trace a more or less complete cycle of development:

(1) Stability at Site 2, a representative large village excavated in 1938 (see this report, pp. 360-365 and 458-460).

(2) Slightly less stability at Site 1, also a representative large village excavated in 1938 (see this report, pp. 323-359 and 458-460).

(3) Instability at Sites 1, 2, and 4, very small villages excavated in 1937 (see Martin, Lloyd, and Spoehr, 1938, pp. 293-300).

(4) Slightly more stability at Site 3, excavated in 1937 (see Martin, Lloyd, and Spoehr, 1938, pp. 293-300).

(5) Stability at medium-sized villages excavated in 1928 and 1929 (see this report, Appendix A, pp. 474-480) and at portions of Lowry ruin (see Martin, Roys, and von Bonin, 1936, pp. 204-209).

Periods of stability and instability probably obtained at large pueblos such as Spruce Tree House and Cliff Palace at Mesa Verde National Park. The greater density of population, however, would inevitably have quickened the rates of change of these periods in these large pueblos because more people and more villages would have brought about interchange of ideas and accordingly would have sped up the disintegration and reintegration of folk-ways.

All that we know of the historical period in the southwestern pueblos is consonant with these conjectures and reconstructions. We still find the pueblos stable for a period and then breaking up under the influence of various factors and, after a period of transition, reaching a new stability.

The researches of 1938 support all the evidence gathered in other years and reinforce the conjectures made in my report on the 1937 excavations.

The advantage of making historical conjectures about this region is very great because it is possible to verify or to disprove many of them by further archaeological investigations and by correlating these researches with those carried on by southwestern ethnologists. We now have all the links and all the stages of development in the pre-history of the extreme western portion of southwestern Colorado from Basket Maker III to Pueblo III. Everything "clicks" perfectly. Our work will probably dovetail with that of Morris and Brew (who have worked respectively, east and west of us) when published; and our hypotheses may be further tested by their results.

APPENDIX A: SUMMARY OF EXCAVATIONS IN PUEBLO II VILLAGES

(Ackmen-Lowry Area, Southwestern Colorado, 1928 and 1929)

This report (No. 3) on Basket Maker culture in the Ackmen-Lowry area of southwestern Colorado, closes the volume (XXIII) dealing with the archaeological work of Field Museum of Natural History in that region. Therefore I thought it wise to include herein a brief summary of my excavations in this same region in unit-type and rim rock houses (Developmental Pueblo or Pueblo II). These excavations were undertaken when I was a member of the Staff of the Colorado State Historical Society (1927-29). This work, it is true, has already been reported upon in some detail (Martin, 1929, 1930), but these papers are now out of print. Moreover, by summarizing this work in these various ruins in this place, I have brought together the results of ten seasons of research in one area. Every culture period that I know of in the extreme western part of southwestern Colorado is therefore brought together in the various numbers of this volume (XXIII): to wit; Basket Maker (No. 3); Pueblo I and early Pueblo II (Developmental Pueblo; No. 2); Late Pueblo II (Appendix, No. 3); Pueblo III (Lowry ruin; No. 1).

The following summary is given with the kind permission of the Board of Directors of the State Historical Society.

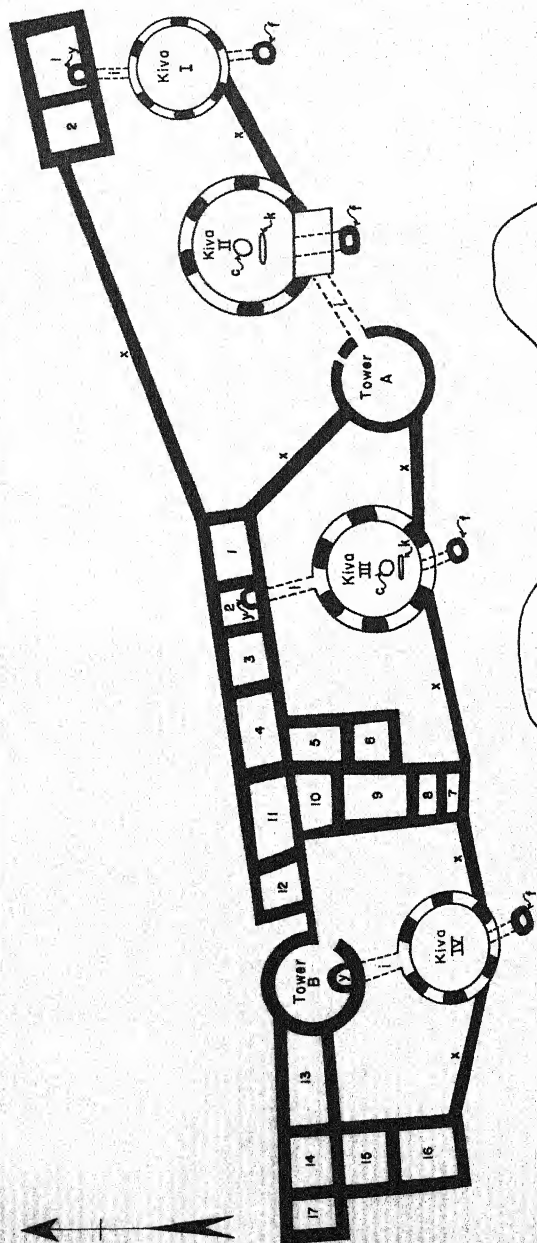
UNIT-TYPE VILLAGES

PUEBLO DETAILS

(Five villages; 49 rooms excavated)

Two fairly large unit-type villages, located on Mr. Ed. Herren's land (NW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 18, Township 38 N., Range 18 W.; and SW $\frac{1}{4}$ of the SW $\frac{1}{4}$ of Section 7, Township 38 N., Range 18 W., N.M.P.M.) about two and one-half miles southeast of the Lowry ruin, on a sage-covered ridge near Ruin Canyon; two just south of Lowry ruin; and one about one mile north of Lowry. Principal axis of superficial rooms east to west. Rooms often in double rows. Pueblo; but one story high. Eight to twenty rooms and two kivas to a pueblo. Rooms averaged 2 by 3 meters. Kivas and refuse mounds to south of rooms. Low walls surrounding village.

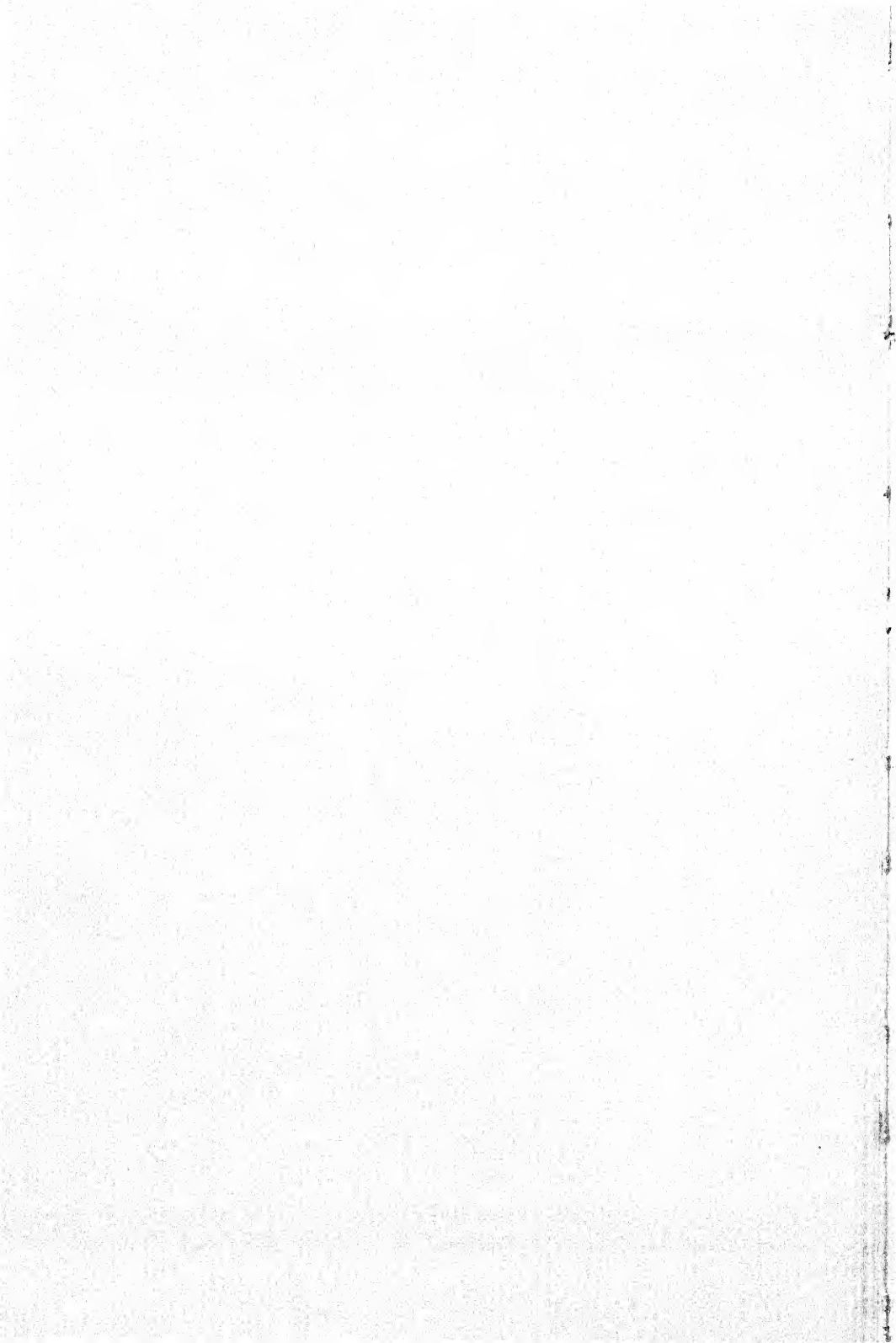
Walls of masonry, laid without foundation; small, random stones, unshaped but somewhat dimpled; stones meet and touch in center without a core of any kind. Mortar of adobe, untempered, 2 to 5 cm.



- c firepit
- f ventilator
- i subterranean passage
- k deflector
- x low walls
- y manhole



MAP 27. GROUND PLAN OF UNIT-TYPE PUEBLO (EXCAVATED 1928), HERREN FARM. NEAR LOWRY RUIN



thick. No spalls. Highest standing wall, 52 cm.; original height (estimated), 2 meters. Greatest thickness, 36 cm.; least, 25. Coursing inferior. Abutments more common than bonding, but latter technique used.

Doorways.—None found. Entrance probably through roof. If doorways were near ground level, we should have found them; if, however, sills were more than 54 cm. above ground level, the doorways would not be found, since the walls above that height had collapsed.

Manholes.—Found in floors of several rooms, near kivas. Served as entrances to tunnels which led to north recesses of kivas.

Floors.—In some rooms, of slabs, laid closely together; spaces between them, chinked with adobe. In other rooms, of hard-packed, smoothed adobe.

Firepit.—Only one found; circular depression in floor; no rim.

Bin.—One only; square; walls of stone slabs set erect.

Post-holes.—None found.

Roofs.—Type and height unknown. Roof beams probably laid across tops of stone walls, as many pieces of burned adobe bearing beam impressions were found. Height probably about 1.7 meters.

KIVA DETAILS (UNIT-TYPE PUEBLO)

(Twelve kivas excavated)

Shapes.—Round, diameters varying from 3.6 to 5.2 meters.

Walls (in and above bench) of very excellent masonry. Coursing pronounced. Sixty to 70 per cent of stones, block-like, rectangular, well shaped, and worked. More than 95 per cent of stones dimpled. No spalls of any kind (might have washed out). Stones laid in mud cushion, 1 to 4 cm. thick. Bits of plaster observed. In one kiva, walls above bench; of native earth. Masonry better than that in secular rooms.

Benches of masonry. Pilasters built on bench. Heights of benches varied from 1.1 meters to 1.22 meters. Horizontal portions of benches of slabs; about 60 cm. in width.

Niches.—Generally two in each kiva, in face of bench.

Southern Recesses (same height as benches) present in all kivas.

Floors of hard-packed smoothed adobe. Depths below ground level varied from 2 to 3.1 meters.

Firepits present in all kivas; in normal positions; circular; diameters ranged from 30 to 50 cm.; depths from 20 to 30 cm.

Deflectors present in all kivas; each composed of a vertical stone slab.

Ventilators of lateral type; walls of tunnels and shafts, of masonry; roofs of tunnels, covered by small horizontal poles. Shafts and tunnels, about 75 cm. square. In one instance, tunnel opened into an antechamber(?), walls of which were of gypsum, measuring 1.52 meters by 2.43 meters.

Sipapus.—Not always located. Present in normal position in four kivas.

Pilasters.—Each kiva provided with six masonry pillars, built on bench. Heights of pilasters above bench varied from 61 cm. to 80 cm.

Roofs.—Beams rested on pilasters in such a way as to form a cribbed roof. Roof probably 2 to 2.5 meters high.

TOWERS

(Seven excavated)

Towers were found in all five unit-type villages which were excavated. Some villages had two of these special structures. The diameters of the towers varied from 3.65 to 4 meters and were probably one story high. All provided with doorways to the outside, sills about 30 cm. above ground level. Heights of doorways unknown; widths varied from 58 cm. to 72 cm. No benches; no firepits. The main feature was that each tower served as a special means of entrance to a kiva. In the floor of each one was a manhole giving access to a tunnel which led to the kiva. The walls of the manhole and tunnel were of masonry; the roof of the tunnel, of small poles; the floor, of hard-packed dirt. Dimensions of all these manholes and tunnels, about the same: width, 60 cm.; height, 70 cm. There was no definite orientation of these tunnels; the average length was about 3 meters. One of them entered the kiva at the north; another, at the northwest; another, at the southwest (directly into the southern recess); one, at the east.

POTTERY

Mancos black-on-white and indented-corrugated. A sprinkling of McElmo black-on-white.

GENERAL COMMENTS

Under one of these unit-type villages were discovered three pit houses similar to that found at Site 1, 1937 (Martin, 1938, pp. 242-

243) and of Pueblo I affinities. Pottery (whole pieces) found on the floor (pit houses) consisted of Lino gray, Kana-a gray (banded neck, plain ware), Abajo red-on-orange, Mancos black-on-white, and indented-corrugated ware. Thus, stratigraphically, we have proof of the sequence of Pueblo I and Pueblo II.

A RIM ROCK PUEBLO

A "rim rock" village is a pueblo consisting of kivas and secular rooms, built on the rim or edge of a canyon. One such village was excavated (NE $\frac{1}{4}$ of Section 18, Township 38 N., Range 19 W., N.M.P.M.); on north rim of Ruin Canyon, about 3 miles southeast of Lowry ruin, on land belonging to Mr. Dane C. Huffington.

PUEBLO DETAILS

Twenty-two rooms excavated. Axis of village more or less east and west. Two kivas, incorporated in village. Rooms at least two stories high; averaged about 2 meters square.

Walls of masonry, without foundations. Random stones (block-like, round, heart-shaped, triangular) used as veneer for rubble core; a few through stones; average thickness of walls, 38 cm. Coursing evident, but not good. Stone to stone contacts frequent. Joints and courses chinked with mud or with mud and false spalls; bearing spalls also present. (For discussion of spalls, see Martin, 1936, pp. 29 and 115-142.) Dimpling common. Similar to Rooms 4, 5, 6, and 20 at Lowry ruin. Highest standing wall, 3.7 meters. Abutment and bonding techniques used.

Doorways.—Nine in number; six leading to outside and three to other rooms. One "diagonal" doorway. Sills, at ground level or about 55 cm. above ground level. Widths of doorways, 40 cm. to 50 cm.; heights, 90 cm. to one meter.

Floors of hard-packed adobe; in some rooms of bed-rock and some adobe.

Firepits.—None observed.

Bins.—One observed; divided into four compartments; located in center of floor. Near it were corn-grinding stones.

Ventilator Openings.—Several observed; generally in dividing walls. About 20 cm. square; distance above floor varied from 8 cm. to 90 cm.

Ceilings.—Composed of one main, horizontal, socketed beam, which crossed the width of the room in the middle; of eight or nine secondary beams which either rested on a ledge or in a socket; and of

smaller poles, bark, and mud. Heights of principal beams above floor, 1.7 meters to 2 meters.

Pottery.—McElmo black-on-white predominant, indented-corrugated; some Mancos black-on-white.

KIVA DETAILS (RIM ROCK RUIN)
(Two kivas discovered and excavated)

KIVA I

Shape.—Round. Diameter (over bench), 4.5 meters.

Walls, in bench and above bench, of coursed masonry. Very excellent and much better than that in secular rooms. Ninety-nine per cent of the stones dimpled. Almost all stones block-like. No visible spalls. Mud cushion.

Bench of masonry. Pilasters rest on bench. Height of bench, 1.22 meters; depth or width, 30 cm. Seat of bench, of slabs.

Niche in face of bench, on northeast side. Height of niche, 38 cm.; width, 30 cm.; depth, 25 cm. Height of floor of niche above floor of kiva, 30 cm.

Southern Recess present; but at same level as kiva floor.

Floor of smooth, hard-packed adobe resting on rubble, which was packed in to level off uneven bed-rock. On same level as surrounding rooms.

Firepit in normal position; merely a depression without slab-lining; circular. Diameter, 51 cm.; depth, 25 cm.

Deflector.—None required because of type of ventilator.

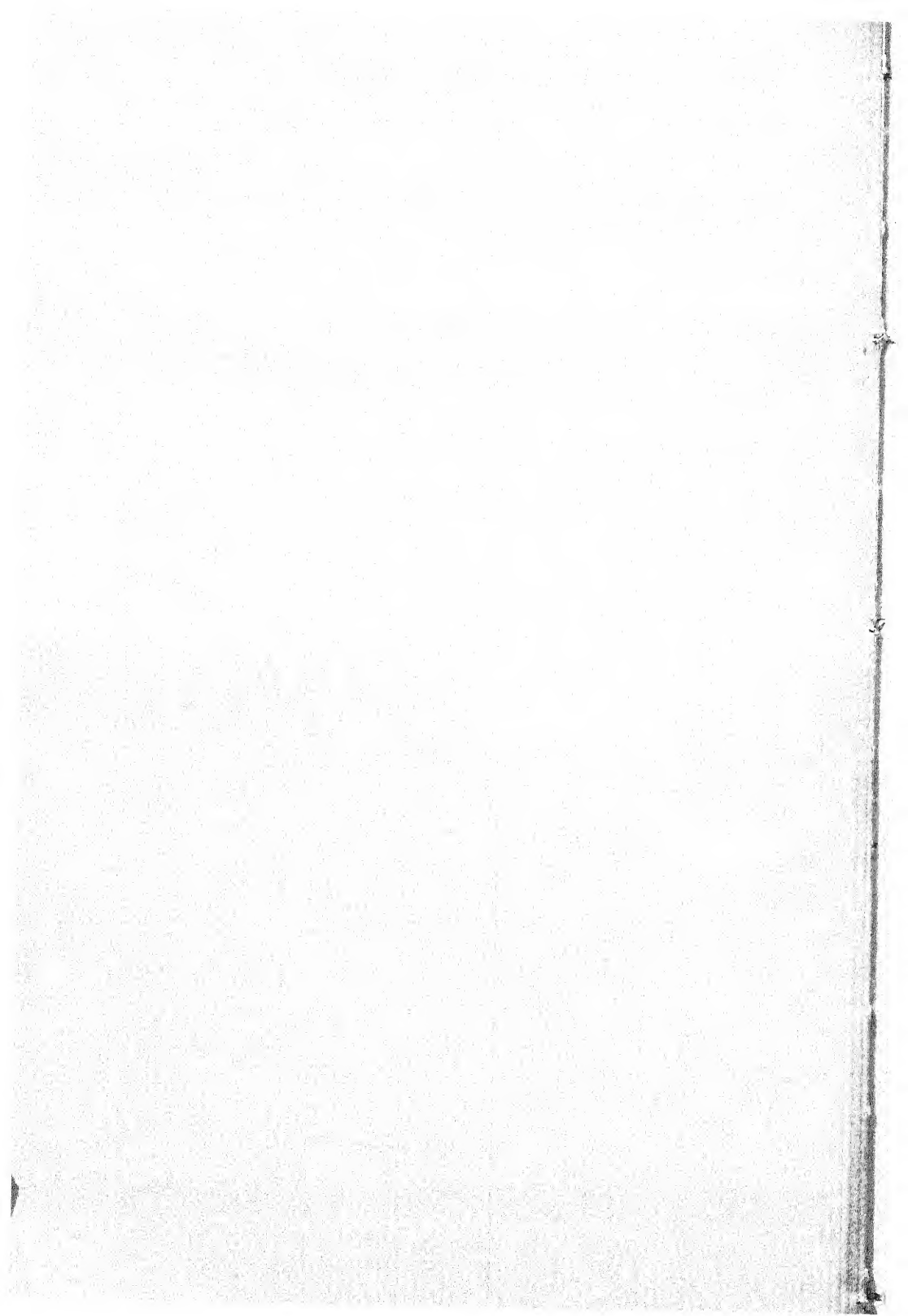
Ventilator.—Sub-floor type (i.e. tunnel ran under floor of southern recess, with opening, 31 cm. square, in kiva floor, just south of fire-pit). Tunnel floor lay 45 cm. below floor. Walls of tunnel and shaft, of masonry. Roof of tunnel, of small poles. Dimensions of shaft and tunnel, 76 cm. by 45 cm.

Sipapu.—Not found.

Pilasters.—Six found; built on bench; five intact and one fragmentary. Height of pilasters above bench, 66 cm.

Roof.—Cribbed; of cedar logs, laid from pilaster to pilaster, the row above being drawn nearer the center of the chamber and cutting across the corners of the first series; the finished roof resembling a dome. Probably more than 2 meters high.

Pottery.—McElmo black-on-white, indented-corrugated; a little Mancos black-on-white.



General Comments.—This kiva was built within a rectangular space, possibly an older room. Although the kiva was built on the same level as the secular rooms, it may have been considered as technically subterranean because of the refuse which was packed in around the kiva walls. Entrance was probably through the roof, as no doorway was found. This structure did not burn.

KIVA II (RIM ROCK RUIN)

Shape.—Square with rounded corners. Greatest width (over bench), 4.27 meters.

Walls, of bench and above bench, of excellent coursed masonry (see description above, of masonry in Kiva I). Height, when excavated, 3.66 meters.

Bench.—Three narrow shelves (none on south side) or recesses, 30 cm. deep, 1.52 meters long, and 1.22 meters above floor.

Niches.—Three found. One, in southwest corner, flush with kiva floor, measured 90 cm. high, 60 cm. wide, and 50 cm. deep. The second, in northeast corner, 15 cm. above kiva floor, measured 30 cm. high, wide, and deep. The third, in north wall, 10 cm. below bench, measured 10 cm. high, 18 cm. wide, and 10 cm. deep.

Southern Recess.—None.

Floor of hard-packed, smoothed adobe. On same level as surrounding rooms.

Firepit round; in normal position; a shallow depression; 1 meter in diameter. Filled with ash.

Deflector.—Single large sandstone slab, set vertically; 1.4 meters long and 75 cm. high.

Ventilator.—Lateral type. Width of tunnel originally 1.4 meters; later modified by secondary masonry which diminished width to 36 cm. Height, 70 cm. Tunnel ran south for about 1 meter, then turned east for a distance of about 2 meters. Shaft 3.5 meters high. Walls of tunnel and shaft of good masonry; floor of hard-packed adobe. Tunnel covered by roofing of small poles.

Sipapu.—None noted.

Pilasters.—Strictly speaking, none. There were four rounded corners (of masonry) which had been inserted in a square room (to make the kiva appear circular), but these were not the only roof supports.

Roof.—Unlike most kiva roofs; not cribbed. Roof timbers lay crisscross; six main roof beams, 20 to 30 cm. in diameter, ran north

and south; beam ends rested on outer kiva walls. Secondary roof beams, 10 to 12 cm. in diameter, ran east and west. Roof probably about 3 meters high.

Pottery.—McElmo black-on-white, indented-corrugated; a little Mancos black-on-white. Two McElmo black-on-white mugs found on floor on north side.

General Comments.—This kiva was constructed by converting a square, secular room into a roundish room and adding a few regular kiva features (niches, deflector, ventilator). Entrance must have been through the roof, as no doorway was found. This structure was partially destroyed by fire.

CONCLUSIONS

No tree-ring dates were obtained from either the unit-type villages or the rim rock pueblo. However, by correlating the pottery, artifacts, and architecture with the same factors at Lowry Pueblo, where a stratigraphic, dated sequence was worked out, it is possible to state that unit-type villages are slightly older than the rim rock pueblos. I would date unit-type villages at about A.D. 1000 (plus or minus twenty-five years) and rim rock pueblos at about A.D. 1075 (plus or minus twenty-five years).

APPENDIX B: POTTERY DATA

NUMBER AND KINDS OF SHERDS AND APPROXIMATE PERCENTAGES

RO=Red-on-Orange; BG=Black-on-Gray; O=Orange; R=Red;
BO=Black-on-Orange

SITE 1

ALL SUPERFICIAL ROOMS, SITE 1

WARES	LEVEL 1		LEVEL 2		TOTAL
	No.	%	No.	%	
Lino Gray.....	4343	78	1043	80	5386
Kana-a Gray.....	665	12	131	10	796
Abajo RO.....	267	5	45	4	312
Indeterminate O.....	249	5	77	6	326
La Plata BO.....	23	..	2	..	25
Lino BG.....	31	..	3	..	34
Lino Incised.....	4	..	..	..	4
"Pink" Ware.....	2	..	1	..	3
San Francisco R.....	2	..	..	..	2
Total.....	5586		1302		6888

PIT HOUSE A, SITE 1

WARES	LEVEL 1		LEVEL 2		TOTAL
	No.	%	No.	%	
Lino Gray.....	779	80	134	58	913
Kana-a Gray.....	90	9	31	13	121
Abajo RO.....	32	3	36	16	68
Indeterminate O.....	45	5	26	11	71
La Plata BO.....	3	..	..	..	3
Lino BG.....	16	2	1	..	17
"Pink" Ware.....	7	1	4	2	11
San Francisco R.....	1	..	..	..	1
Total.....	973		232		1205

PIT HOUSE B, SITE 1

WARES	LEVEL 1		LEVEL 2		LEVEL 3		LEVEL 4		LEVEL 5		LEVEL 6		TOTAL
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
Lino Gray.....	37	74	86	77.0	127	73	108	73	103	76	1059	83	1530
Kana-a Gray...	6	12	12	11.0	24	14	23	16	16	12	117	9	198
Abajo RO.....	2	4	4	4.0	8	4	11	7	10	7	49	4	84
Indeterminate O	5	10	8	7.5	10	6	5	4	4	4	35	3	67
Lino BG.....	..	..	1	0.5	5	3	1	..	2	1	20	1	29
Fugitive Red...	..	..	..	..	..	..	..	..	..	..	1	..	1
Total.....	50		111		174		148		135		1291		1909

PIT HOUSE C, SITE 1

WARES	LEVEL 1		LEVEL 2		LEVEL 3		LEVEL 4		LEVEL 5		LEVEL 6		TOTAL
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
Lino Gray.....	233	76	172	80	123	76.0	143	71.5	104	70.0	297	79	1077
Kana-a Gray...	27	9	20	9	23	15.0	34	17.0	20	13.0	39	10	163
Abajo RO.....	17	6	12	6	2	1.0	14	7.0	13	9.0	16	4	74
Indeterminate O	22	7	10	5	12	7.0	8	4.0	8	5.5	21	6	81
La Plata BO...	..	..	..	..	1	0.5	..	..	1	0.5	..	..	2
Lino BG.....	7	2	..	..	1	0.5	1	0.5	3	2.0	2	1	14
Total.....	306		214		167		200		149		375		1411

NUMBER AND KINDS OF SHERDS AND APPROXIMATE PERCENTAGES—*Continued*

LESSER GREAT KIVA I, SITE 1

WARES	LEVEL 1		LEVEL 2		TOTAL
	No.	%	No.	%	
Lino Gray.....	530	75.0	66	83	596
Kana-a Gray.....	56	8.0	4	5	60
Abajo RO.....	55	7.5	2	3	57
Indeterminate O.....	55	7.5	4	5	59
La Plata BO.....	11	1.5	2	3	13
Lino BG.....	6	0.5	1	1	7
Total.....	713		79		792

GREAT KIVA II, SITE 1
(No levels)

WARES	No.	%
Lino Gray.....	42	36.0
Kana-a Gray.....	1	1.0
Abajo RO.....	24	20.5
Indeterminate O.....	26	22.5
La Plata BO.....	23	20.0
Total.....	116	

PIT HOUSES B AND C, SITE 1
(Trench around sides. No levels)

WARES	B		C		TOTAL
	No.	%	No.	%	
Lino Gray.....	160	71.0	216	83.0	376
Kana-a Gray.....	28	13.0	21	8.0	49
Abajo RO.....	16	6.5	10	4.0	26
Indeterminate O.....	20	9.0	10	4.0	30
La Plata BO.....	...	...	2	0.5	2
Lino BG.....	2	0.5	2	0.5	4
Total.....	226		261		487

PIT HOUSES D AND E, SITE 1
(No levels)

WARES	D		E		TOTAL
	No.	%	No.	%	
Lino Gray.....	66	81	50	79	116
Kana-a Gray.....	5	6	6	10	11
Abajo RO.....	4	5	..	..	4
Indeterminate O.....	4	5	5	8	9
Lino BG.....	2	3	2	3	4
Total.....	81		63		144

SITE 1
(Exploratory trench; no levels)

WARES	No.	%
Lino Gray.....	2195	75.0
Kana-a Gray.....	365	12.5
Abajo RO.....	165	5.5
Indeterminate O.....	168	6.0
Lino BG.....	26	1.0
Total.....	2919	

PIT HOUSE B, SITE 1
(Exploratory trench; all levels)

WARES	No.	%
Lino Gray.....	202	78.0
Kana-a Gray.....	28	11.0
Abajo RO.....	14	5.5
Indeterminate O.....	14	5.5
La Plata BO.....	1	...
Lino BG.....	1	...
Total.....	260	

NUMBER AND KINDS OF SHERDS AND APPROXIMATE PERCENTAGES—*Continued*

CACHE PIT (Sq. 20A) SITE 1

(No levels)

WARES	No.	%
Lino Gray.....	1136	76.5
Kana-a Gray.....	151	10.0
Abajo RO.....	98	6.5
Indeterminate O.....	98	6.5
Lino BG.....	7	0.5
Total.....	1490	

PIT HOUSE C, SITE 1

(Fill back of masonry; no levels)

WARES	No.	%
Lino Gray.....	44	83
Kana-a Gray.....	6	11
Abajo RO.....	1	2
Indeterminate O.....	2	4
Total.....	53	

Total number of sherds from Site 1: 17,674

SITE 2

EAST SECTION, SITE 2

(All superficial rooms)

WARES	LEVEL 1		LEVEL 2		TOTAL
	No.	%	No.	%	
Lino Gray.....	939	83.0	631	88	1570
Kana-a Gray.....	5	0.5	..	..	5
Abajo RO.....	85	7.5	45	6	130
Indeterminate O.....	81	7.0	27	4	108
Lino BG.....	9	1.0	7	1	16
Lino Incised.....	1	..	..	..	1
Fugitive Red.....	10	1.0	5	1	15
Total.....	1130		715		1845

CENTRAL SECTION, SITE 2

(All superficial rooms)

WARES	LEVEL 1		LEVEL 2		TOTAL
	No.	%	No.	%	
Lino Gray.....	2332	90	828	88.0	3160
Abajo RO.....	129	5	63	7.0	197
Indeterminate O.....	86	3	30	3.0	116
Lino BG.....	18	1	5	0.5	23
Fugitive Red.....	22	1	12	1.5	34
Total.....	2587		943		3530

WEST SECTION, SITE 2

(All superficial rooms)

WARES	LEVEL 1		LEVEL 2		TOTAL
	No.	%	No.	%	
Lino Gray.....	1153	88.0	473	89.5	1626
Kana-a Gray.....	1	..	2	..	3
Abajo RO.....	90	7.0	27	5.0	117
Indeterminate O.....	42	3.0	15	3.0	57
Lino BG.....	16	1.5	3	0.5	19
Fugitive Red.....	8	0.5	8	2.0	16
Total.....	1310		528		1838

NUMBER AND KINDS OF SHERDS AND APPROXIMATE PERCENTAGES—*Continued*

PIT HOUSE A, SITE 2

WARES	LEVEL 1		LEVEL 2		TOTAL
	No.	%	No.	%	
Lino Gray.....	214	87	442	81	656
Abajo RO.....	15	6	59	11	74
Indeterminate O.....	13	5	46	8	59
Lino BG.....	4	2	2	..	6
Total.....	246		549		795

PIT HOUSE B, SITE 2

WARES	LEVEL 1		LEVEL 2		TOTAL
	No.	%	No.	%	
Lino Gray.....	373	83.0	219	72.0	592
Abajo RO.....	47	10.5	56	18.5	103
Indeterminate O.....	19	4.0	25	8.0	44
Lino BG.....	1	..	1	..	2
Fugitive Red.....	10	2.5	4	1.5	14
Total.....	450		305		755

PIT HOUSE C, SITE 2

WARES	LEVEL 1		LEVEL 2		TOTAL
	No.	%	No.	%	
Lino Gray.....	316	89	424	86	740
Abajo RO.....	21	6	49	10	70
Indeterminate O.....	15	4	18	4	33
Lino BG.....	5	1	2	..	7
Total.....	357		493		850

PIT HOUSE D, SITE 2

WARES	LEVEL 1		LEVEL 2		TOTAL
	No.	%	No.	%	
Lino Gray.....	1468	85	91	76.5	1559
Abajo RO.....	111	6	14	12.0	125
Indeterminate O.....	87	5	4	3.5	91
Lino BG.....	14	1	..	..	14
Fugitive Red.....	29	2	10	8.0	39
Trailed corrugated.....	15	1	..	..	15
Abajo polychrome.....	5	..	..	..	5
Total.....	1729		119		1848

PIT HOUSE E, SITE 2

(No levels)

WARES	No.	%
Lino Gray.....	195	89
Abajo RO.....	12	6
Indeterminate O.....	4	2
Lino BG.....	2	1
Fugitive Red.....	5	2
Total.....	218	

NUMBER AND KINDS OF SHERDS AND APPROXIMATE PERCENTAGES—*Continued*

PIT HOUSE F, SITE 2

WARES	LEVEL 1		LEVEL 2		TOTAL
	No.	%	No.	%	
Lino Gray.....	550	80.0	54	89.0	604
Kana-a Gray.....	1	....	1	1.5	2
Abajo RO.....	70	10.5	1	1.5	71
Indeterminate O.....	49	7.5	5	8.0	54
Lino BG.....	5	0.5	..	....	5
Fugitive Red.....	11	1.5	..	....	11
Trailed corrugated.....	1	....	..	....	1
Total.....	687		61		748

PIT HOUSE G, SITE 2

WARES	LEVEL 1		LEVEL 2		TOTAL
	No.	%	No.	%	
Lino Gray.....	162	88.0	265	87	427
Kana-a Gray.....	1	0.5	..	..	1
Abajo RO.....	10	5.5	24	8	34
Indeterminate O.....	4	2.0	8	3	12
Lino BG.....	5	3.0	5	2	10
Fugitive Red.....	2	1.0	2	..	4
Total.....	184		304		488

PIT HOUSE H, SITE 2

WARES	LEVEL 1		LEVEL 2		TOTAL
	No.	%	No.	%	
Lino Gray.....	150	89	161	86	311
Kana-a Gray.....	14	8	..	..	14
Abajo RO.....	..	..	19	10	19
Indeterminate O.....	3	2	6	3	9
Lino BG.....	1	1	..	..	1
Fugitive Red.....	..	..	1	1	1
Total.....	168		187		355

SITE 2

(Exploratory trench. All levels)

WARES	No.	%
Lino Gray.....	1341	82.0
Kana-a Gray.....	2	....
Abajo RO.....	142	9.0
Indeterminate O.....	95	6.0
Lino BG.....	40	2.5
Fugitive Red.....	9	0.5
Trailed corrugated.....	2	....
Abajo polychrome.....	2	....

Total..... 1633

CACHE PIT (Sq. 65A), SITE 2

(No levels)

WARES	No.	%
Lino Gray.....	69	84.5
Abajo RO.....	3	3.5
Indeterminate O.....	1	1.0
Lino BG.....	8	10.0
Lino Incised.....	1	1.0

Total..... 82

Total number of sherds from Site 2: 14,985

NUMBER AND KINDS OF SHERDS AND APPROXIMATE PERCENTAGES—*Continued*

SUMMARY TABLE

(All levels, pit houses, etc., lumped together)

SITE 1			SITE 2		
WARES	No.	%	WARES	No.	%
Lino Gray	13,613	77.0	Lino Gray	12,850	86
Kana-a Gray	1,949	11.0	Kana-a Gray	27	..
Abajo RO	927	5.0	Abajo RO	1,097	7
Indeterminate O	951	5.5	Indeterminate O	683	5
La Plata BO	71	0.5	Lino BG	153	1
Lino BG	141	1.0	Lino Incised	2	..
Lino Incised	4	..	Fugitive Red	148	1
"Pink" ware	14	..	Trilled corrugated	18	..
Fugitive Red	1	..	Abajo polychrome	7	..
San Francisco R	3	..			
Total	17,674		Total	14,985	

Total number of sherds from both sites: 32,659

APPENDIX C: NOTES ON EXCAVATIONS AT ALKALI RIDGE, UTAH

BY

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During the summer and fall of 1938 I had the great pleasure of making two visits to Dr. Paul Martin's excavations west of Ackmen in southwestern Colorado. The two main sites, with a large number of rooms and pit houses carefully excavated, presented immediately striking parallels with Site 13 of the Peabody Museum excavations at Alkali Ridge in southeastern Utah. Although the intervening country is cut up by many canyons, Alkali Ridge is only from twenty to twenty-five miles west of Dr. Martin's excavations.

Peabody Museum Site Ab 7-13 was a relatively large site, the main part of which was occupied during Basket Maker III-Pueblo I times, and had two small later Developmental units at the north end. In the cultural horizons which bear the closest relationship to Dr. Martin's recent finds, we excavated 117 small storage rooms with twenty-four adjacent living rooms and fifteen pit houses. This was not by any means the full extent of the structures occupied during these periods, but this excavation was sufficiently extensive to enable us to reconstruct the plan of the site in all essential details.

During the course of the excavations in and around these structures, a number of artifacts of pottery, bone, and stone were found. The striking similarity between the architecture of Site 13 and the buildings of Dr. Martin's site is to be found also in the pottery and other artifacts.

The earliest structures uncovered at Alkali Ridge were shallow pit houses, suggestive in general appearance of those found by Roberts in his excavations at Shabik'eschee Village in the Chaco Canyon. The southern antechambers, unlike those of the later pit houses, were relatively large, almost as extensive as the main parts of the houses. Individual storage chambers and a small amount of Lino black-on-gray pottery were associated with the pit houses.

Superimposed on this type of pit house were the storage chambers and living rooms associated with the next horizon on the site. The buildings covered an area 80 by 150 meters, and were arranged in four rows, running in a slight curve in an easterly direction from the main north-south row. Two short rows also ran out to the west.

At the ends of the contiguous rectangular rooms and in the open spaces or plazas between the rows were found the pit houses.

Small storage rooms, ranging in size from 1.5 meters square to 2 by 4 meters, formed the backbone of the long rows of above-ground structures. The walls of these rooms were, for the most part, of thin upright slabs, standing to a height of from 50 to 55 cm. These slabs were heavily plastered, but the walls, including the plaster, were relatively thin, only 10 to 15 cm. in thickness. Since the walls were so thin, extra support was necessary for the roofs, and in every room post-holes were found in or near the corners. Above the slabs was an approximation of coursed masonry, which is best described perhaps as alternate courses of stone and adobe. The stones were of sandstone, trimmed to sufficient narrowness. The adobe was from 8 to 10 cm. in thickness, sometimes in the form known as turtleback. This was the most common type of wall for the storage rooms. In some, however, the slabs had been omitted in the wall construction, and the alternate courses of stone and adobe came down to the original ground level. A few of the walls were of post and adobe construction. In one peculiar instance, these three types occurred in the walls of a single room.

In front of and joined to the storage chambers were larger rooms, which served as the ordinary living quarters. The floors of the storage chambers had been slightly excavated to varying depths, but the floors of the front rooms were at the original ground level. In almost all cases, the walls of these rooms on the three sides away from the storage chambers were of upright post and adobe construction. Whereas no fireplaces or other features suggesting domiciliary use were found in the small rooms, these others presented such evidence wherever they were excavated or tested. Each room contained from one to three firepits, and large numbers of corn-grinding tools were found lying on the floors and stacked against the walls.

In association with the above-ground structures were a number of pit houses. The earlier shallow pit houses have already been described. Two other types were found at Site 13, small deep pit houses and large pit houses of medium depth. The ground plans of the main rooms were all very similar, with an elaboration of detail in the large ones. The deep pit houses, however, had very small southern antechambers, some of them apparently vestigial and serving only as ventilators. As at Shabik'eschee, an occasional pit house was found with a small ventilator shaft substituted for the southern antechamber. Although they were identical in ground plan

with the earlier pit houses, their depth was that of the later kivas, and, to attain this depth, it had been necessary to cut down often as much as three feet into the ledge rock underlying the red earth of the mesa top.

Another step in the development of the San Juan kiva is observable in the deep pit houses. While many of them had the roughly rectangular shape generally associated with pit houses, some of them were much more circular and one closely approximated a true circle. In all except the latter, the standard four-post roof support common to pit houses in this region was found. In Pit House D, however, there were six roof support posts instead of four, and these six posts were in positions corresponding to the pilasters of later Mesa Verde kivas.

In three of the four main plazas were found structures of a type which might properly be called the Great Pit House. Evidently one of these sufficed for each section of the site, and they seem to have superseded the small, deep pit houses.

Lino gray and Abajo red-on-orange pottery were found *in situ* on the floors of both later types of pit houses and of the above-ground contiguous storage chambers and living rooms. The small pit houses, however, were all burned and filled with refuse containing the same type of sherds, showing that they were used and abandoned during this period. The larger pit houses were filled above the roof debris with blow sand and wash deposits, suggesting that they were used up to the abandonment of this horizon of occupation.

The large pit houses at Site 13 probably correspond in part to the large circular structures discovered by Dr. Martin in southwestern Colorado. On Alkali Ridge they were only thirty feet in diameter and definitely roofed. However, since it appears that they superseded smaller pit houses in serving a greater number of the populace, it is probable that there is a direct functional correlation with Dr. Martin's big circles.

One of the outstanding and, it may be said, startling features of Site 13 was its pottery. Although the site is in the black-on-white area of the San Juan, and painted bowls and jars occur in great numbers, black-on-white decoration is almost totally absent. The very few exceptions which do occur are in the form of isolated sherds of Lino black-on-gray or McElmo and Mesa Verde fragments intrusive from the later horizons.

The designs on a majority of the bowls and sherds were executed in brilliant red on an unslipped orange background. The paint was

largely hematite. Although by far the larger proportion of painted sherds show a red color, there is a considerable range through the purples to black. Two half bowls were found which were actually black-on-gray but which, upon refiring, attained the red-on-orange normal to the site. The Alkali Ridge excavations demonstrated clearly the danger of classifying pottery on color alone. Because of the great variability in color which can be achieved from the same clay or paint, I requested Miss Anna O. Shepard of the Carnegie Institution to make a list of the factors which affect the color of fired clay. In reply, I received a list of twenty-four factors. For the present, although there is a considerable range of color, I prefer to classify this ware under the name, Abajo red-on-orange.

In association with the Abajo red-on-orange, we found a rather fine, thin variety of Lino gray, occurring in standard shapes: globular jars with and without necks, large water-jars with lug and horizontal strap handles, a few bird forms, and a very few bowls. Banded necks on this same ware occurred very rarely, and either were just beginning to come in or never became fashionable on Alkali Ridge. The latter possibility is strengthened by the fact that we found no sites in the immediate vicinity where banded necks occurred in any appreciable frequency. No spiral coiling or indented corrugation was found in association with the Abajo ware.

The designs, as well as the colors, varied greatly from those expected on the pottery of the region. In general, they were very broad line and heavy block designs, somewhat crudely executed when compared with the work of Pueblo potters in the later periods. However, the crudeness was by no means always noticeable; some of them, particularly those involving triangles, were most carefully turned out. The designs usually covered the whole field of the inside of the bowl, but, in a few cases, an unpainted circular area was left in the bottom. In a very few cases indeed, the design was divided into quadrants. Statistical tabulation showed the most fashionable design by far to be very broad parallel wavy lines running across the bowl, around the bowl in circular formation, or, in three cases, spirally up from the bottom to the top. The next most popular group of designs was strings of triangles in the same three arrangements. Third in popularity were key patterns, single or double, again arranged in parallel straight rows, parallel circular rows, or parallel spirals. Checkerboards were less common than in later times, but, when they did occur, the individual squares were very much larger than those on the common checkerboards of McElmo

and Mesa Verde black-on-white. A number of other designs occurred in lesser frequency.

Two outstanding impressions are gained by an examination of the large collections of Abajo designs. One is immediately aware of their similarity to the designs of Basket Maker II baskets. They are almost completely textile designs. Even the spirals are to be found on baskets from Grand Gulch in the American Museum of Natural History. One need not then go far to discover the immediate source of the designs on the eighth century Abajo pottery.

The other important impression made by these designs is their dissimilarity to the designs on the pottery which follows them chronologically—usually the McElmo black-on-white and associated wares. Further study of the designs, however, leads one to doubt that this difference is so great as it at first appears. The painting technique is certainly different, and, for the most part, the general treatment—the massiveness of the designs—differs greatly from the run-of-the-mill of the Pueblo II group. However, in the Developmental Pueblo sites on Alkali Ridge we did find an appreciable number of black-on-white vessels with checkerboards, triangles, and key designs as large as those on the Abajo red-on-orange. Because of this, we should consider the possibility that the Abajo designs may have had a greater influence on the pottery of the following periods than a cursory glance would lead one to expect.

During the course of the excavations at Site 13, a large amount of charred wood was encountered, as most of the structures had burned while in use, although not simultaneously. Unfortunately, however, very little datable wood was discovered. A few pieces of pinyon have been dated, and these dates fall within the eighth century (Stallings, 1937).

The masonry, architecture, and pottery at Site 13, Alkali Ridge, briefly described above, compare very closely with much of the material found by Dr. Martin in southwestern Colorado. It is very gratifying that more work is being done upon this type of ruin. As shown by surface indications of both architecture and pottery, such ruins occur in great numbers in practically continuous distribution from the vicinity of Bluff, Utah, to some point east of Mesa Verde, at least. Many of them are villages of great size. I have paced a number of them on the mesa tops in the northern San Juan drainage and on Mesa Verde itself which are much greater in extent than either Site 13 on Alkali Ridge or the two excavated by Dr. Martin. They were first noticed in 1875 by W. H. Jackson and by W. H.

Holmes and were described by them in the reports of the Hayden Survey (Jackson, 1878, pp. 411-450; Holmes, 1878, pp. 385, 386). Since then, however, they have been completely ignored, except by Mr. Earl Morris of the Carnegie Institution, who has published a partial account of his work on Johnson Mesa (Morris, 1919) and has described his work in this type of ruin much more completely in his forthcoming La Plata report.

Dr. Martin's sites lie approximately halfway between the Peabody Museum work on Alkali Ridge and Mr. Morris's work on Johnson Mesa, and, as was expected, this intermediate position is reflected in the nature of the remains.

APPENDIX D: REPORT OF DATES FROM SITES 1 AND 2 SOUTHWESTERN COLORADO

The following information was supplied by Mr. Harry T. Getty:

"Here is the report on the dates obtained from the archaeological tree-ring specimens obtained in the process of your excavations this past summer (1938). The data are in tabular form and I believe the column headings are sufficiently clear; but there are a few points which will bear further explanation.

"In the column headed "Specimen number," the numbers are specimen identifications issued here in the laboratory. The letter or first number refers to the pit house or room, the second number (immediately following the letter) refers to the sack number, and the third number refers to the individual specimen in the sack mentioned. For example: A-2-1 indicates specimen No. 1 in sack No. 2 from Pit House A; A-3-2 indicates specimen No. 2 in sack No. 3 from Pit House A.

"The column headed "Outside dated ring" gives the date of the *outermost ring present on the specimen*. If that ring was *plainly* the outside ring on the log (in other words, if it was the original exterior of the log as it was used in construction) then the *same date* is repeated in the column headed "Bark date." If the exterior of the specimen is broken and the outermost ring present is *plainly not* the original exterior of the log (in other words, if some of the exterior rings have been lost), then the date is repeated in the "Bark date" column with the notation "+x." The designation "+x" indicates that some rings are missing from the exterior of the specimen, but that we do not know how many. In *wood* specimens, where the contact between the heartwood and sapwood is visible, it is sometimes possible to estimate the number of rings lost at the exterior by comparing the number of sapwood rings present with the number of sapwood rings normally present in that species of tree, and considering also certain other pertinent facts. In charcoal the heartwood-sapwood contact is not evident, and in my opinion we are not able even to estimate the number of rings lost at the exterior (Dr. Haury and other tree-ring workers concur in this opinion). There is this one possibility in connection with specimens that evidently have rings missing at the exterior. In the case of Pit House D, Site 1, one specimen giving a date of A.D. 861 has the exterior present. The other specimen, with a broken exterior, gives a date of 857. One might assume that this latter log (D-1)

had the same original exterior, which would give the same date, 861, and that four rings have been lost; but even that is assuming too much, for, in Pit House C, all four specimens show the exterior (even the bark is present), yet two give a date of 857 and two give a date of 858. That difference in dates in Pit House C might be accounted for by supposing that they used dead timber, or that some logs left over from a previous year were used. I would like to say right here that I think we make a mistake in attempting to say that a particular bit of construction took place in a specific year, unless all the specimens from that particular piece of construction give the same date and have the exteriors present. In some instances, for example, in a case of superposition of structures, it may be an advantage to know as exactly as possible the building dates. The significant thing, to my mind, is that the structures at your Site 1 were built in the middle 800's, while the building activity at your Site 2 took place a century earlier. But to get back to my main thesis, I am not prepared to say, judging from the tree-ring specimens, what the value of "x" should be. It is *perhaps* possible that you can judge that value from your archaeological data.

"The date of $612+x$ from Room 51, Site 2, needs some comments. There is only one specimen that yields this date. The dating is correct, as it has been checked and rechecked by Dr. Haury, who is very familiar with the ring sequence in the 600's. The exterior rings are missing, but the original exterior should have fallen in the 600's, judging by the size, shape, and general condition of the specimen. The only explanation I can offer is that it represents a re-used log, extracted from the remains of a structure of an earlier period.

"Due to the long illness of Dr. Douglass and the absolute lack of time on the part of Dr. Haury, it has been possible for them to check the dating on key specimens only, not each individual date. But they have checked the key specimens for the 800 group, for the 700 group, and the 612 date. I rechecked each date myself, and also had one of the advanced tree-ring students do some spot-checking.

"It may be of some interest to you to know that I handled 210 pinyon specimens and 190 juniper specimens. There was one carton of material from Pit House B which was entirely juniper, and I did not keep a count of the number of specimens in that carton. The large amount of pinyon is the thing that slowed down the work of handling the collection. Of course, each pinyon specimen had to be thoroughly worked, and, of the three datable types of wood, pinyon is the toughest to handle. There are a great many dated

specimens which I have not attempted to list, as they are duplicates of the specimens which I have listed. They are evidently specimens from the same logs. In the accompanying report where I have given duplicate dates for the same structure it is because the inner dates are different or else the ring sequences in those specimens are very excellent.

"There may be some points which are not clear to you. If so, I shall be very glad to do what I can toward clearing them up."

DENDROCHRONOLOGICAL DATA OBTAINED FROM TREE-RING SPECIMENS*

Site number	Location at site	Specimen number	Outside dated ring	Inside dated ring	Approx. radius in mm.	Rings absent in series	Rings lost outside	Estimated bark date
1	Pit House A	A-2-1	870	805	14	0	0	870
		A-2-2	868	797	14	0	0	868
		A-3-2	872	816	20	0	0	872
1	Pit House B	B-2-1	869	817	11	0	0	869
		B-2-2	868	807	8	0	0	868
		B-3	858	790	18	0	0	858
		B-11	837	720	28	0	?	837+x
		B-14-1	841	794	15	0	?	841+x
		B-15-1	855	812	13	0	0	855
		B-15-3	856	787	19	0	?	856+x
1	Pit House C	B-18-1	858	812	23	0	0	858
		C-1-1	858	790	21	0	0	858
		C-11-2	857	790	17	0	0	857
		C-14-1	858	761	22	1 (819)	0	858
1	Pit House D	C-15-2	857	812	15	0	0	857
		D-1	857	797	15	0	?	857+x
1		D-2	861	801	12	0	0	861
1	Room 5	5-1-1	859	795	21	0	0	859
		5-3-1	860	790	10	0	0	860
1	Room 11	11-1	856	815	15	0	?	856+x
2	Pit House G	G-5-1	761	693	17	0	?	761+x
		G-8-1	768	724	17	0	?	768+x
		G-9-2	736	687	20	0	?	736+x
		G-11-1	763	716	15	0	?	763+x
		G-12-1	765	717	15	0	?	765+x
		G-12-2	762	714	16	0	?	762+x
2	Slab House 2	SLH	763	710	20	0	?	763+x
2	Room 34	....	768	695	16	0	?	768+x
2	Room 35	....	762	704	19	0	?	762+x
2	Room 51	51-1	612	542	12	0	?	612+x
2	Room 56	....	747	691	18	0	?	747+x

* Secured by Dr. Paul S. Martin, Field Museum of Natural History, in southwestern Colorado, during the summer of 1938. Laboratory work by H. T. Getty, University of Arizona, Tucson. Dates checked (type specimens) by Dr. A. E. Douglass and Dr. E. W. Haury.

Type of wood: all dated specimens are pinyon.

Type of specimens: all dated specimens are charcoal sections.

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